REMEDIAL SITE ASSESSMENT DECISION - EPA NEW ENGLAND

Site Name: Connecticut Sppring & Stamping Company **EPA ID#:** CTD001143007

Alias Site Names: ____________________

Address: 48 Spring Lane **City:** Farmington **State:** CT

Refer to Report Dated: 07-11--97 **Report type:** SIP

Report developed by: RFW /CoE

DECISION:

| | **1. Further Remedial Site Assessment under CERCLA (Superfund) is <u>not</u> required because:**

| | 1a. Site does not qualify for further remedial site assessment under CERCLA (No Further Remedial Action Planned - NFRAP)

| | 1b. Site may qualify for further action, but is deferred to: | | RCRA | | NRC

|X| **2. Further Assessment Needed Under CERCLA:**

2a. (optional) Priority: |X | Higher | | Lower

2b. Activity Type: | | PA | | SI | | ESI | | HRS evaluation

| X] Other: Further evaluation needed

DISCUSSION/RATIONALE:

There is a potential release to the surface water and potential contamination of surface water targets.

There has been a release to groundwater and contamination of groundwater targets.

Report Reviewed and Approved by:

Don Smith Signature: Don Smith Date: July 11, 1997

Site Decision Made by:

Don Smith Signature: Don Smith Date: July 11, 1997

EPA Form # 9100-3

FINAL SITE INSPECTION PRIORITIZATION REPORT
FOR
CONNECTICUT SPRING & STAMPING COMPANY
FARMINGTON, CONNECTICUT

CERCLIS No. CTD001143007
TDD No. 9408-01-CWX
Delivery Order No. 0002

Prepared by:

Roy F. Weston, Inc.
67 Batterymarch Street
Boston, Massachusetts 02110-3110

July 11, 1997

ROY F. WESTON, INC.

Reviewed and Approved:

Tom Gary 7/11/97

Task Manager Date

Robert E. Merrill 7/11/97

Delivery Order Manager (or designee) Date

Alexander Costerly 11 JULY 97

QA Review Date

Work Order No. 10971-002-012-0007

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This report was prepared solely for the use and benefit of the U.S. Environmental Protection Agency Region I (EPA Region I) Office of Site Remediation and Restoration for the specific purposes set forth in the contract between the U.S. Army Corps of Engineers New England Division and Roy F. Weston, Inc. (WESTON®). Professional services performed and reports generated by WESTON have been prepared for EPA Region I purposes as described in the contract. The information, statements, and conclusions contained in the report were prepared in accordance with the statement of work, and contract terms and conditions. The report may be subject to differing interpretations or misinterpretation by third parties who did not participate in the planning, research or consultation processes. Any use of this document or the information contained herein by persons or entities other than the EPA Region I shall be at the sole risk and liability of said person or entity. WESTON therefore expressly disclaims any liability to persons other than the EPA Region I who may use or rely upon this report in any way or for any purpose.

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INTRODUCTION

Roy F. Weston, Inc. (WESTON®) was requested by the U.S. Environmental Protection Agency Region I (EPA Region I) Office of Site Remediation and Restoration to perform a Site Inspection Prioritization (SIP) of the Connecticut Spring & Stamping Company (Connecticut Spring) property at 48 Spring Lane in Farmington, Connecticut. Tasks were conducted in accordance with the SIP scope of work and technical specifications provided by the EPA Region I. A Screening Site Inspection (SSI) Report for the Connecticut Spring property was prepared by the NUS Corporation Field Investigation Team (NUS/FIT) on July 2, 1990. NUS/FIT documented a 1981 spill of approximately 400 to 800 gallons of waste tetrachloroethylene (PCE) to the ground along the eastern portion of the manufacturing building. In addition, analytical results from on-site groundwater samples revealed elevated concentrations of chlorinated solvents, including PCE. On the basis of the information provided in the SSI Report, the Connecticut Spring SIP was initiated.

EPA Region I has also requested WESTON to perform SIP investigations on 15 facilities, including Connecticut Spring, which are located within and adjacent to the Farmington Industrial Park (FIP) in Farmington and Plainville, Connecticut. For the purposes of this report, these 15 facilities will be referred to as the FIP area.

Background information used in the generation of this report was obtained through file searches conducted at EPA Region I and the Connecticut Department of Environmental Protection (CT DEP), telephone interviews with town officials, conversations with persons knowledgeable of the Connecticut Spring property and conversations with other Federal, State, and local agencies. Additional information was gathered during the WESTON on-site reconnaissance on March 8, 1995 and environmental sampling on July 12, 1995.

This package follows the guidelines developed under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, commonly referred to as Superfund. These documents do not necessarily fulfill the requirements of other EPA regulations such as those under the Resource Conservation and Recovery Act (RCRA) or other Federal, State, or local regulations. SIPs are intended to provide a preliminary screening of sites to facilitate EPA Region I's assignment of site priorities. They are limited efforts and are not intended to supersede more detailed investigations.

SITE DESCRIPTION

The Connecticut Spring property is part of the FIP and is located at 48 Spring Lane in Farmington, Hartford County, Connecticut at geographic coordinates 41° 42′ 06″ north latitude

Note: Text which appears in italics indicates that original portions of the Screening Site Inspection Report were either copied or paraphrased.

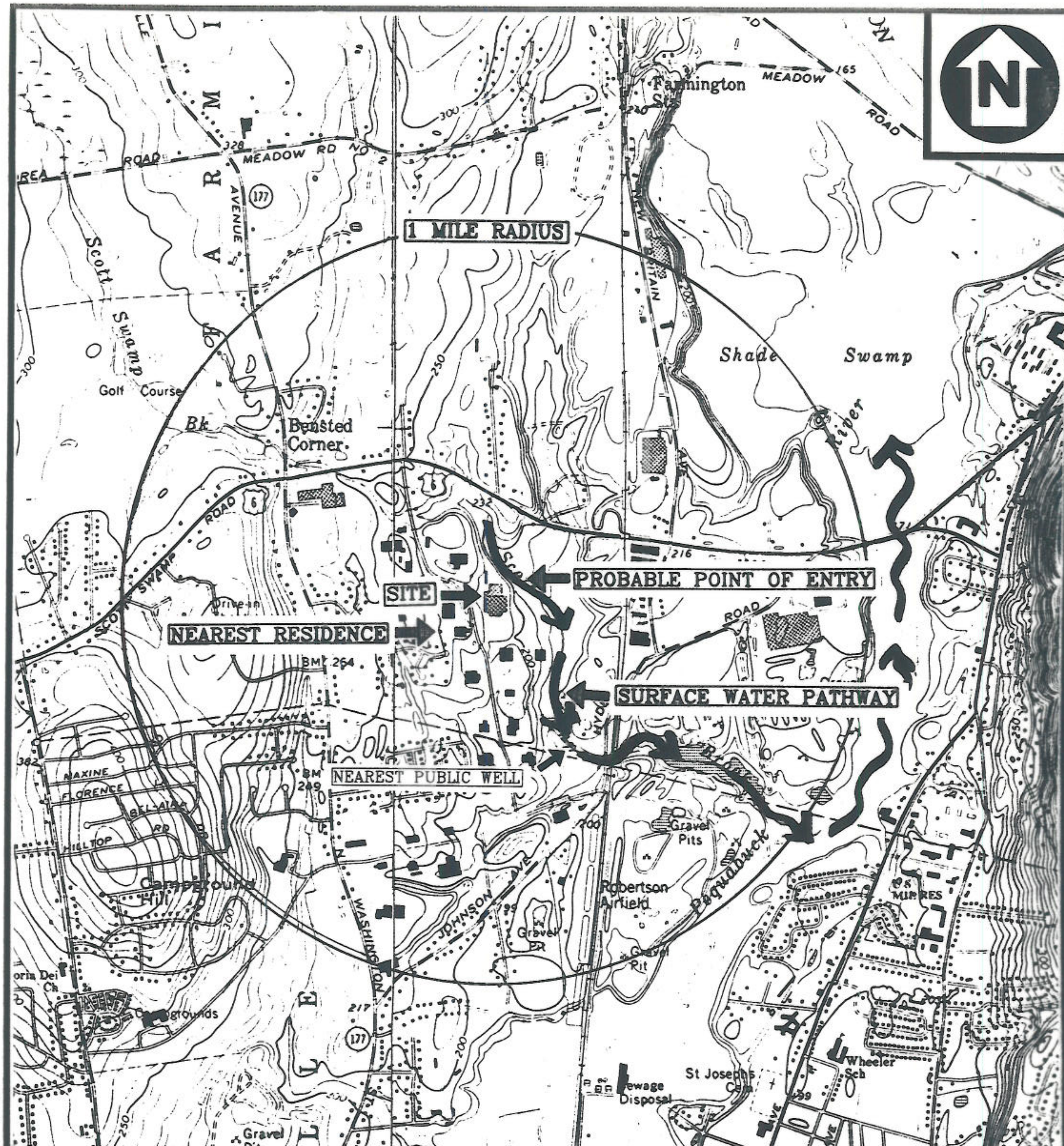
and 72° 52′ 12″ west longitude (Figure 1A and 1B) [1; 2]. According to the Farmington Tax Assessor's Office, the Connecticut Spring property is depicted on Map No. 77 as Lot No. 12C and is owned by the Connecticut Spring and Stamping Corporation (Figure 2) [3; 4; 7]. Connecticut Spring was established at this location in 1960 [1; 7].

The Connecticut Spring property is approximately 17.5 acres and is occupied by a single 120,000-square foot (sq ft) manufacturing building [1; 3; 4; 7]. The surrounding area is zoned for industrial and residential use. The Connecticut Spring property is abutted to the north by New England Aircraft Plant #1 (CERCLIS No. CTD059831479), to the west by Spring Lane and Edmunds Manufacturing (CERCLIS No. CTD054187455), to the south by the New England Clock Company, and to the east by a steep slope leading down to the West Branch of Scott Swamp Brook (Figure 2) [3; 4].

Based on observations made by WESTON during the March 8, 1995 on-site reconnaissance, the on-site manufacturing building contains office and manufacturing space for the production of springs and stamped metal products [3]. Drum storage areas are located at several locations throughout the manufacturing building. The facility's main drum storage is located near the southwest corner of the manufacturing building (Figure 2) [3; 6]. Large paved parking areas are located on the north and south sides of the manufacturing building (Figure 2) [3; 6]. An active loading dock is located along the north side of the manufacturing building and a double loading dock is located on the southwest corner of the manufacturing building [3; 6]. The Connecticut Spring property can be accessed from the west using driveways located along Spring Lane [4]. There are no fences or gates surrounding the property which restrict vehicular or pedestrian access. The north, south, and east perimeters of the property are wooded, and the remainder of the Connecticut Spring property is covered by pavement or maintained lawn [3; 4; 6]. No visible signs of stained soils or stressed vegetation were observed during the WESTON on-site reconnaissance [3; 6].

In May and June 1988, TRC Environmental Consultants (TRC) installed seven overburden monitoring wells on the property (Figure 2) [62; 63]. In 1989, Hubbard Hall contracted HRP Associates, Inc. (HRP) to investigate the potential impact to local groundwater caused by the 1981 PCE spill. In October 1989, HRP installed 12 overburden and 4 bedrock monitoring wells at the property (Figure 2) [61]. During the on-site reconnaissance, WESTON attempted to locate and verify the condition of these wells. Monitoring wells MW-1, MW-2, and MW-2S were destroyed; HH-9 was uncapped; and BR-4 and well cluster HH-12-1 through HH-12-5 could not be located [3; 6]. A production well was observed at the southeast corner of the manufacturing building [1; 62; 63]. No additional information regarding years of use or construction of this well was available in file information.

Surface water runoff from the property is generally directed to the southeast toward the West Branch of Scott Swamp Brook (Figure 2) [3; 4]. The northern parking lot has two storm water catch basins which discharge to a drainage ditch and retention pond southwest of the manufacturing building [3; 6]. The drainage ditch receives the discharge from the northwest parking lot in addition to non-contact air conditioning and air compressing cooling water [1; 3; 6]. The drainage ditch slopes south to the retention pond and then bends east around the southern parking lot where it ultimately discharges into the West Branch of Scott Swamp Brook, located approximately 150 feet east of the manufacturing building [1; 3; 5].



BASE MAP IS A PORTION OF THE FOLLOWING U.S.G.S. 7.5 MINUTE QUADRANGLE:
NEW BRITAIN, CT, 1968; REVISED 1984 1:24,000

1 MILE 0.5 0 1

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

QUADRANGLE LOCATION: NEW BRITAIN, CONNECTICUT

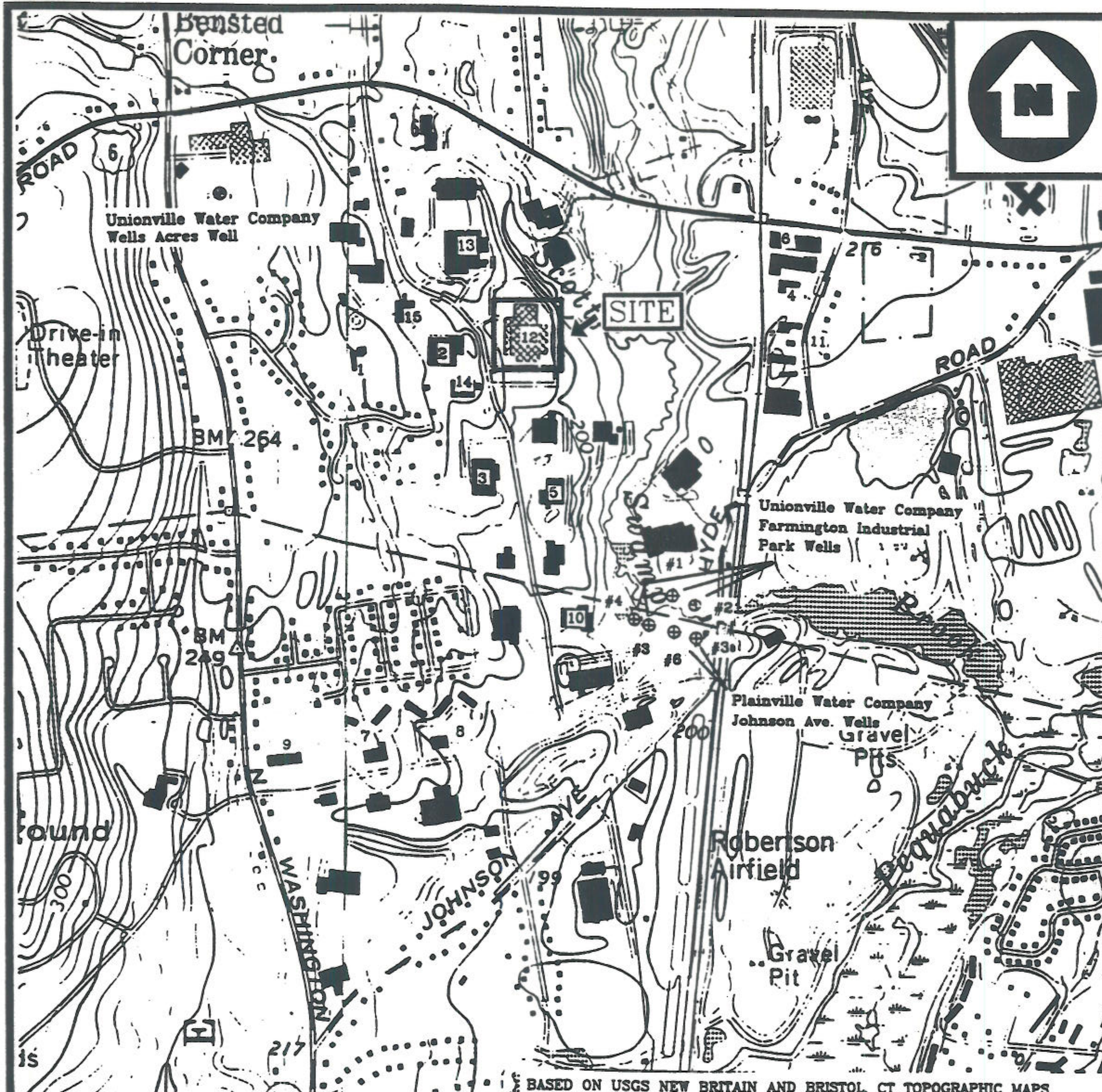
P: \DWG\RHC\SPRING\FIG-1.DWG (PLOT 1=1)

LOCATION MAP

CONNECTICUT SPRING & STAMPING CORPORATION
FARMINGTON, CONNECTICUT

WESTON

FIGURE 1A



LEGEND

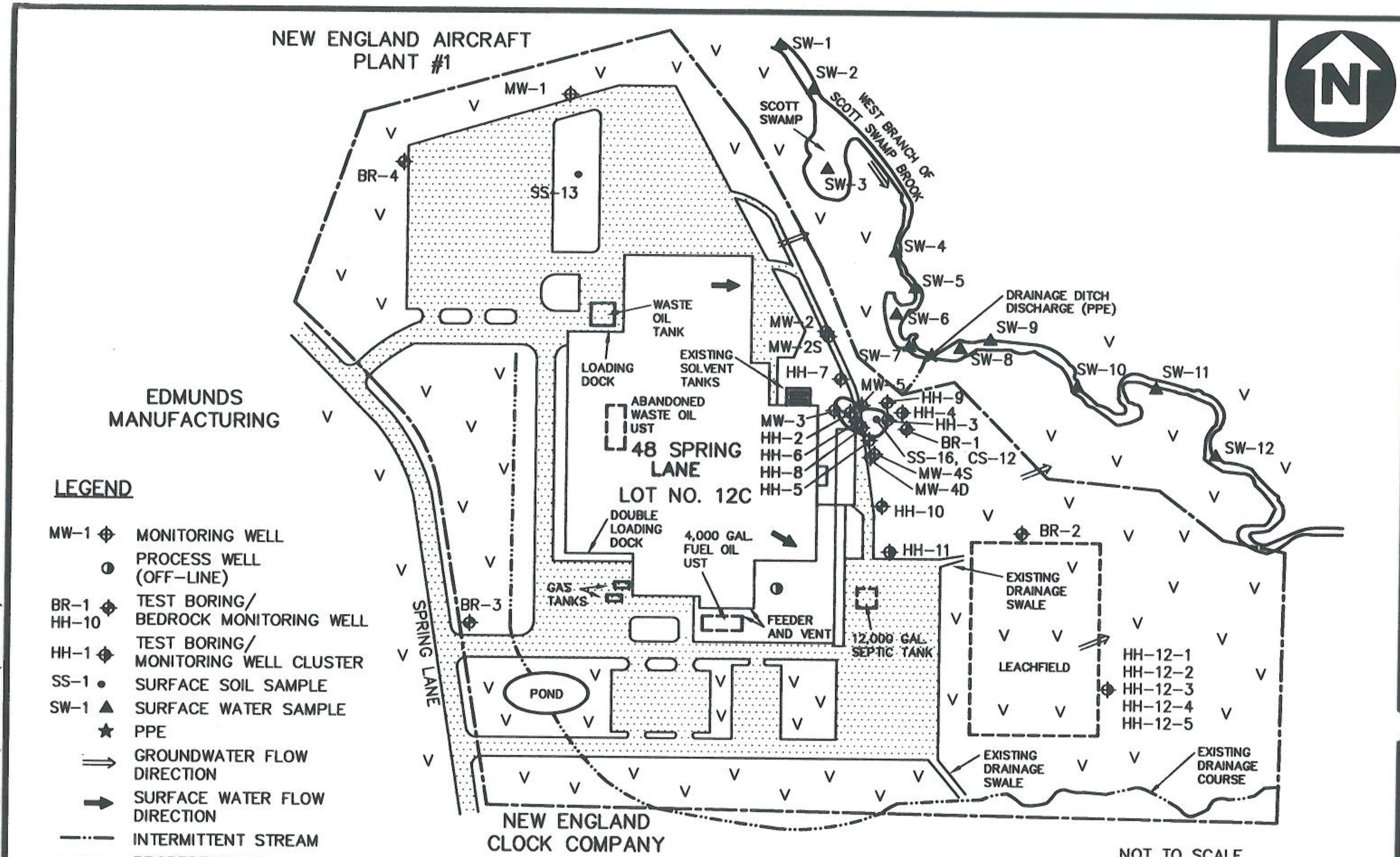
1 – Dell Manufacturing Co.
2 – Edmunds Manufaturing Co.
3 – Fletcher–Terry Company
4 – Gros–ite Ind., Inc.
5 – Kip, Inc.
6 – Whitnon–Spindle
7 – American Tool and Manufacturing
8 – Brown Manufaturing
9 – ESCO Laboratories
10 – Mott Metallurgical Co.
11 – Roy Machinery and Sales
12 – Connecticut Spring & Stamping
13 – New England Aircraft Plant No. 1
14 – New England Aircraft Plant No. 2
15 – Mallory Industries

AREA MAP

FARMINGTON INDUSTRIAL PARK PROPERTIES
FARMINGTON/PLAINVILLE, CONNECTICUT

WESTON

FIGURE 1B



SITE SKETCH

CONNECTICUT SPRING & STAMPING COMPANY
FARMINGTON, CONNECTUCUT

WESTON MANAGERS DESIGNERS/CONSULTANTS

FIGURE 2

Based on available file information and discussions with facility representatives, several septic systems have been used on-site for both sanitary and industrial waste disposal. A 2,000-gallon septic tank and leachfield were located under the west side of the manufacturing building. A second 1,200-gallon septic tank was located on the east side of the property and a third system, which includes a 12,000-gallon tank is currently located on the southeast side of the property. Industrial wastes were reportedly discharged to the septic tank and leachfield on the southeast side of the property from 1970 to 1973 [1]. There are no available records documenting the types and quantities of industrial wastes discharged to this septic system. The septic tank and leachfield on the east side of the property could not be located, but reportedly received sanitary waste only [1; 5]. The property was connected to the town sewer system in 1974 [1].

A 1,200-gallon waste oil aboveground storage tank (AST), located under the production room floor in the west-central portion of the manufacturing building, was used until the early 1970s [1]. The 1,200-gallon AST was filled with sand and abandoned in place in 1972 (Figure 2) [1]. Two 6,000-gallon gasoline underground storage tanks (USTs) are located adjacent to and south of the double loading dock. In October 1989, an 8,500-gallon fuel oil UST, located on the south side of the manufacturing building, was removed and replaced with a 4,000-gallon UST. Two 2,000-gallon ASTs used for PCE solvent storage are located along the eastern side of the manufacturing building (Figure 2). These tanks were reportedly in use until 1987, when they were abandoned in place. One of the ASTs was used to store pure PCE and the other AST was used to store waste PCE. During the NUS/FIT on-site reconnaissance, the ASTs were observed to be severely rusted. Three wet/dry dust collectors are located along the eastern side of the manufacturing building, north of the PCE ASTs. A 1,000-gallon waste oil AST is located on the northwest side of the manufacturing building [1; 3; 5].

The nearest residence is located approximately 600 feet southwest of the Connecticut Spring property at 37 Wells Drive (Figure 1A) [4]. The nearest verified private drinking water well to the property is located approximately 1.5 miles north-northwest of the Connecticut Spring property on Washington Avenue in Farmington, Connecticut and serves an estimated three people [53]. The nearest public drinking water well is FIP Well No. 4 and is located approximately 0.28 miles southeast of the Connecticut Spring property (Figure 1A) [4; 31; 32]. FIP Well No. 4 is operated by the Unionville Water Company (UWC) and serves an estimated 477 people.

OPERATIONAL AND REGULATORY HISTORY AND WASTE CHARACTERISTICS

Prior to development in 1960, the Connecticut Spring property and surrounding properties were reportedly used for agricultural purposes [1, p. 2]. The property has been owned and operated by the Connecticut Spring and Stamping Corporation since 1960. Manufacturing processes at the Connecticut Spring property include; stamping, winding, degreasing, tumbling, and tempering [1; 3]. Wastes generated at the property reportedly include metal chips, unspecified cleaning solvents, and cutting oils [1; 3; 64; 66].

During 1970, more than 2,000 gallons per day (gpd) of metal preparation wastes, including solvents and tumbling wastes were discharged to a 2,000-gallon septic tank and leaching area located under the west side of the manufacturing building. In addition, Connecticut Spring reportedly discharged air compressor cooling water to Scott Swamp Brook. Sanitary wastes were *directed to two additional septic systems; one southeast of the manufacturing building and the other east of the manufacturing building. The exact location of these three septic tanks is not known. In addition, waste disposal practices prior to 1970 could not be determined from available file information.*

A 1970 State of Connecticut Water Resources Commission (CT WRC) inspection (Form P-5) reported that Connecticut Spring generated the following wastes; metal scraps, water and oils, oil, PCE, and trichloroethylene (TCE), grinding dust, and cyanide solution [65]. According to the inspection, wastes generated during on-site manufacturing operations were discharged to the ground this practice took place from approximately 1970 to 1973 [65].

During 1973, Connecticut Spring reportedly discharged 200 gpd of acidic passivating wastes (sulfuric acid, nitric acid, hydrochloric acids; potassium permanganate, dichromate, sodium cyanide, hexavalent chromium, cyanide, carbonate, and hydroxide) to the sanitary septic system located southeast of the manufacturing building. In addition, 260 gpd of finishing wastes (chemical cleaners and rust preventing oils) were reportedly discharged to the septic tank and leachfield under the west side of the manufacturing building, during 1973.

In March 1980, a CT DEP Water Compliance Unit (WCU) inspection reported that an unspecified solvent storage tank with a leaking line and a small drum storage area were located in the vicinity of the northwest parking lot corner. It was not specified at which parking lot the drum storage area was located. The WCU inspection also identified a 385-foot production well that Connecticut Spring installed in 1979 near the southeast corner of the manufacturing building. Water from the on-site production well was used for air conditioning and air compressor cooling prior to 1988, at which time it was determined that the water reportedly contained elevated concentrations of solvents. Water is currently supplied by public sources.

In June 1980, the CT DEP WCU issued order number 2824 to Connecticut Spring to install treatment equipment and conduct a groundwater study due to elevated concentrations of volatile organic compounds (VOCs) detected in the nearby FIP and Johnson Avenue wells [1].

In December 1981, a Hubbard Hall tank truck spilled approximately 400 to 800 gallons of PCE along an unpaved area on the service road east of the manufacturing building while refilling an on-site solvent tank [1]. An unknown quantity of PCE may have entered Scott Swamp Brook before it could be contained [1]. This incident was reported to the CT DEP and Hubbard Hall subsequently removed approximately 18 inches of soil in a 35-foot radius (or 30 tons) around the spill area [1].

On May 12, 1982, CT DEP referred order number 2824 to the Office of the Attorney General as Connecticut Spring had not completed the requested groundwater investigation [1]. On May 20, 1982, Connecticut Spring informed CT DEP that TRC had been retained to perform the groundwater investigation. In late 1982, CT DEP requested Connecticut Spring to attend a meeting with other companies within the FIP and to consider a joint groundwater investigation. After Connecticut Spring agreed to the FIP groundwater study, the CT DEP withdrew the referral to the Attorney General's Office. A March 1986 Preliminary Assessment (PA) conducted by CT DEP reported that the joint groundwater investigation was not completed [1; 3; 5].

Between December 1986 and March 1987, CT DEP collected 13 soil and 21 surface water samples at the Connecticut Spring property [1]. CT DEP samples were analyzed for VOCs; however, the exact analytical method used could not be determined from available file information. In addition, no known reference or quality assurance/quality control (QA/QC) samples were collected [1]. Analytical results from the CT DEP sampling events reported several VOCs above detection limits; these results are further discussed in the Waste/Source Sampling and Surface Water Pathway Sections of this report.

In July 1987, TRC collected six soil and four surface water samples, including reference and duplicate samples at the Connecticut Spring property [62]. The samples were analyzed for VOCs using EPA Methods 8010, 8015, and 8020 for soils and EPA Method 601 for surface water [62]. Analytical results indicated the presence of several chlorinated compounds in soil and surface water samples; these results are further discussed in the Waste/Source Sampling and Surface Water Pathway Sections of this report.

In May and June 1988, TRC advanced seven soil borings, installed seven monitoring wells, and collected subsurface soil and groundwater samples to further evaluate the Connecticut Spring property [63]. The samples were analyzed for VOCs using EPA Method 8010 [63]. In addition, CT DEP collected groundwater samples from TRC monitoring wells during this same period. Results from the two sampling events reported elevated concentrations of eight VOCs in TRC groundwater samples, two VOCs in TRC soil samples, and ten VOCs in the CT DEP samples. The 1988 TRC and CT DEP sampling events are further discussed in the Waste/Source Sampling and Groundwater Pathway Sections of this report.

In 1989, Hubbard Hall contracted HRP to investigate the potential impact to on-site groundwater caused by the 1981 PCE spill. In October 1989, HRP completed a total of 16 borings and installed monitoring wells at each location. Soil samples were collected continuously in the borings except BR-2, BR-3, and BR-4, which were sampled at 5-foot intervals. Soil samples were analyzed for VOCs using EPA Method 8010 [61]. The 1989 HRP sampling event is further discussed in the Waste/Source Sampling and Groundwater Pathway Sections of this report.

In June and August 1990, HRP collected twelve surface water samples from the West Branch of Scott Swamp Brook [61]. The samples were analyzed for VOCs using EPA Method 601/8010. The results indicated that every sample except SW-1 and SW-2, exhibited elevated concentrations of the VOCs PCE, TCE, and 1,1,1-TCA [61]. The HRP surface water sampling event is further discussed in the Surface Water Pathway Section of this report.

In July 1990, NUS/FIT completed an SSI of the Connecticut Spring property [1]. No environmental sampling was conducted as part of the SSI [1].

On March 8, 1995, WESTON and CDM Federal Programs Corporation conducted a joint on-site reconnaissance at the Connecticut Spring property [3]. On July 12, 1995, WESTON collected 11 groundwater, 21 sediment and 2 surface water samples at locations up-gradient and down-gradient of the Connecticut Spring property [53]. WESTON samples were submitted through the EPA Contract Laboratory Program (CLP) for VOC, semivolatile organic compound (SVOC), pesticide/polychlorinated biphenyl (PCB), total metals and cyanide analyses [53]. The VOC fraction of the groundwater samples was analyzed to lower detection limits by EPA Method

524.2 through the EPA Region I Regional Laboratory [51]. The results of this sampling event are summarized in the Groundwater and Surface Water Pathway Sections of this report.

There are eight known potential source areas at the Connecticut Spring property [3]. These include the former septic tanks and associated leachfields, the 1,200-gallon waste oil AST, two 6,000-gallon gasoline USTs, a 4,000-gallon fuel oil UST, two 2,000-gallon PCE ASTs, three wet/dry dust collectors, the 1,000-gallon waste oil AST, and an area of contaminated soil which is based on analytical results from on-site soil samples and historic accounts of on-site spills (Figure 2) [3; 5; 6]. No other treatment, storage or disposal activities are known to have occurred at the property which have resulted in additional source areas. Table 1 presents the structures or areas identified on the Connecticut Spring property which are documented or potential sources of contamination, the containment factors associated with each source, and the relative location of each source [3; 6].

Table 1

Source Evaluation for Connecticut Spring & Stamping Company

Source Area	Containment Factors	Spatial Location
Former Septic Tanks & Associated Leachfields	Designed to release wastewater to groundwater without treatment; buried beneath more than two feet of soil, and therefore contained with regard to potential surficial soil and air releases.	Several septic tanks and leachfields on-site. 1,200-gallon tank located on the east side of the facility, 2,000-gallon tank and leachfield located on west side of facility, and one 12,000-gallon tank and leachfield located on the southeast corner of the property.
Abandoned 1,200 gallon Waste Oil AST	None, this source is available to all pathways.	Under the floor in the central western portion of the manufacturing building.
Two 6,000-gallon Gasoline USTs	Buried beneath more than two feet of soil, and therefore contained with regard to potential surficial soil and air releases.	In the vicinity of the double loading dock by the southwest corner of the manufacturing building.
4,000-gallon Fuel Oil UST	Buried beneath more than two feet of soil, and therefore contained with regard to potential surficial soil and air releases.	Near the south side of the manufacturing building.
Two abandoned 2,000 gallon PCE ASTs	None, this source is available to all pathways.	Along the east side of the manufacturing building.
Three Wet/Dry Dust Collectors.	None, this source is available to all pathways.	Along the east side of the manufacturing building.
1,000-gallon Waste Oil AST	None, this source is available to all pathways.	Northwest of the manufacturing building.
Contaminated Soil 50,000 sq ft	None, this source is available to all pathways.	Based on analytical results from on-site samples and on historic accounts of spills.

Table 2 summarizes the types of potentially hazardous substances which have been disposed, used, or stored on the Connecticut Spring property [1; 3; 5; 6].

Table 2

Hazardous Waste Quantity for Connecticut Spring & Stamping Company

Substance	Quantity or Volume/Area	Years of Use/Storage	Years of Disposal	Source Area
Wastewater from Passivating Area (sulfuric acid, nitric acid, hydrochloric acids; potassium permanganate, dichromate, sodium cyanide, hexavalent chromium, cyanide, carbonate, and hydroxide).	2,000 gpd 200 gpd	1970 1971 - 1973	1970 1971 - 1973	Southeast septic system and leachfield.
Tumbling wastewaters from Finishing Area (rust preventative oils, loose metal, and chemicals left over from the passivating process).	260 gpd	1970 - 1973	1970 - 1973	Western septic system and leachfield.
Heat treatment quenching water (soapy water and salt solution).	10 gpd	1961 - 1974	1961 - 1974	Southeast septic system and leachfield.
Tetrachloroethylene.	400 to 800 gallon spill (2) 2,000-gal. tanks	1981 Spill Tanks in use until 1987	1981	Solvent tanks; released to ground on east side of building.
Waste oil.	Unknown	1961 - present	Unknown	Northwest and west of the manufacturing building.
Trichloroethylene.	Unknown	1961 - unknown	1961 - unknown	Unknown.

* - Quantities listed above are approximations based on available file information.

As of July 1995, 21 CERCLA properties were located in Farmington, Connecticut and 17 CERCLA properties were located in Plainville, Connecticut [8]. Of these, 26 were noted to be located within one mile of the FIP. As of July 1995, 31 RCRA notifiers were located in Farmington, Connecticut and 47 RCRA notifiers were located in Plainville, Connecticut [9]. Of these, 23 were noted to be located within one mile of the FIP. Table 3 presents a summary of properties located in the FIP which are the subject of current CERCLA SIP investigations conducted by WESTON (Figure 1B). Table 3 also provides a description of the types of potentially hazardous substances which have been disposed, used, generated, or stored on these properties.

Table 3

Summary of Substances and Source Areas Associated with Properties Located in the Farmington Industrial Park

Property & CERCLIS No.	Type of Operation	Associated Substances	Years of Use and Storage	Years of Disposal	Source Areas
Dell Manufacturing Co. CTD001139336	Dell manufactures jet engine parts.	1,1,1-Trichloroethane (1,1,1-TCA) Acid etching wastewater Paint waste Waste oils Waste cooling water Wastewater	1967 to March 1995 1967 to 1981 1967 to present 1967 to present 1991 to present 1967 to unknown	Unknown 1967 to 1981 Off-site disposal Off-site disposal Unknown Unknown	UST; drum storage area Drywell Drum storage area 4,000-gallon UST Drywell Septic system
Edmunds Manufacturing Co. CTD054187455	Edmunds manufactures gauges for commercial and industrial uses.	Trichloroethylene (TCE) 1,1,1-TCA Untreated process rinse wastewaters Waste oil Plating wastes	1965 to unknown 1965 to unknown 1965 to 1980 1965 to unknown 1965 to 1980	1965 to unknown 1965 to unknown 1965 to 1980 1965 to unknown 1965 to 1980	Drywell; leach field Drywell; leach field 4,000-gallon UST 3,000-gallon UST UST
Fletcher-Terry Co. CTD001145309	Fletcher manufactures glass cutting tools.	Nitrating salts Waste rinse water Waste cutting oils Grinding sludge 1,1,1-TCA	1969 to unknown 1969 to unknown 1969 to unknown 1969 to unknown 1969 to unknown	1969 to 1975 1969 to 1975 1969 to 1982 1969 to unknown 1969 to 1980	Septic system Septic system Drywell Unknown Drywell
Gros-ite Industries, Inc. CTD982543670	Gros-ite manufactures aircraft parts, machines, machine prototypes, and environmental chambers.	Waste oils PCE	1954 to 1991 1954 to 1976	1954 to 1991 1954 to 1976	3,000 and 1,000-gallon UST Leach field to ground
KIP, Inc. CTD064844426	The KIP property was initially developed by the Sureline in November 1969. From 1969 to 1974, Sureline produced experimental and reconditioned machinery. KIP has been manufacturing solenoid valves at this location since 1983.	TCE Cutting oils and sludge	Unknown 1969 to 1988 Unknown	Unknown 1969 to 1988 Unknown	Unknown 500-gallon UST; concrete UST; drywell 500-gallon UST; concrete UST; drywell

Table 3

Summary of Substances and Source Areas Associated with Properties Located in the Farmington Industrial Park (continued)

Property & CERCLIS No.	Type of Operation	Associated Substances	Years of Use and Storage	Years of Disposal	Source Areas
ESCO Laboratories, Inc. CTD001139310	ESCO, also known as Perma-Type Rubber Company manufactures rubber surgical equipment and surgical cement.	Acetone	1969 to unknown	1969 to unknown	Rear of original building
		Chlorobutane	1969 to unknown	1969 to unknown	Rear of original building
		Ethyl alcohol	1969 to unknown	1969 to unknown	Rear of original building
		Methyl cyclohexane	1969 to unknown	1969 to unknown	Rear of original building
		Methyl iso-butyl ketone	1969 to unknown	1969 to unknown	Rear of original building
		Toluene	1969 to unknown	1969 to unknown	Rear of original building
		Methane	1969 to unknown	1969 to unknown	Rear of original building
		Butane	1969 to unknown	1969 to unknown	Rear of original building
		Propane	1969 to unknown	1969 to unknown	Rear of original building
		Hexane	1969 to unknown	1969 to unknown	Rear of original building
		TCE	1969 to unknown	1969 to unknown	Rear of original building
		1,1,1-TCA	Unknown to 1985	Unknown to 1985	Sanitary sewer
		Phthalate	Unknown	Unknown	Unknown
		Total Petroleum Hydrocarbon (TPH)	Unknown	Unknown	Unknown
Brown Manufacturing CTD001149038	Brown manufactures screw machine products.	1,1,1-TCA	1967 to 1983 1983 to 1987	1967 to 1983 Off-site disposal	Drywell Drum storage area
		Mineral Spirits	1967 to 1983 1983 to 1988 1988 to present	1967 to 1983 Off-site disposal Recycled on-site	Drywell Drum storage area Recycling still
		PCE	1967 to 1983 1983 to 1988 1988 to present	1967 to 1983 Off-site disposal Recycled on-site	Drywell Drum storage area Recycling still
		Cutting Oil	1977 to unknown Unknown to present	Off-site disposal Recycled on-site	2,000-gallon UST Oil extractor centrifuge

Table 3

Summary of Substances and Source Areas Associated with Properties Located in the Farmington Industrial Park (continued)

Property & CERCLIS No.	Type of Operation	Associated Substances	Years of Use and Storage	Years of Disposal	Source Areas
Whitnon-Spindle CTD052538105	Whitnon manufactures ballbearing and oil hydrostatic spindles.	Industrial waste stream (containing 1,1,1-TCA) Water soluble coolant waste Scrap metal soaked with cutting oil Waste machine oil	1955 to 1979 1979 to 1986 1979 to 1991 1991 to present Unknown to present 1955 to 1979 1979 to present 1994 to present	1955 to 1979 Off-site disposal Off-site disposal Off-site disposal Off-site disposal Unknown Off-site disposal Off-site disposal	Surface soil, drywell 1,000-gallon UST 2,000-gallon UST 2,000-gallon UST 30-yard open roll-off container Unknown Drum storage area 1,000-gallon UST
American Tool & Manufacturing Corporation CTD001148949	American Tool performs general metal machining.	TCE Phthalate TPH	1968 to 1980 Unknown Unknown	1968 to 1980 Unknown Unknown	Oil/water separator tank Drum storage Septic system
Connecticut Spring and Stamping Corporation CTD001143007	CSSC manufactures coil and torsion springs and wire forms.	Acidic wastewater Tumbling wastewater Heat quenching wastewater PCE TCE Waste oil Waste oil	1961 to 1974 1961 to 1974 1961 to 1974 1961 to present 1961 to unknown 1961 to 1972 1961 to present	1961 to 1974 1961 to 1974 1961 to 1974 Unknown 1961 to unknown Unknown Unknown	SE septic tank and leach field SE septic tank and leach field SE septic tank and leach field UST east of building UST east of building UST inside building UST northwest of building

Table 3

Summary of Substances and Source Areas Associated with Properties Located in the Farmington Industrial Park (continued)

Property & CERCLIS No.	Type of Operation	Associated Substances	Years of Use and Storage	Years of Disposal	Source Areas
Mallory Industries, Inc. CTD001148568	Mallory manufactures cams for aircraft and other industry.	Tumbling wastewater Water soluble oils Mineral spirits Alkaline soap solution Nitric acid Phosphoric acid Waste oil Solvents Waste oil	1965 to present 1965 to present 1965 to present 1965 to present 1965 to present 1965 to present 1983 to 1995 1983 to 1992 1976 to 1983	1965 to 1986 1965 to 1986 1965 to 1986 1965 to 1986 1965 to 1986 1965 to 1986 Unknown Unknown Unknown	Northeastern drywell Northeastern drywell Northeastern drywell Northeastern drywell Northeastern drywell Northeastern drywell Abandoned waste oil UST Abandoned waste solvent UST Removed waste oil UST
New England Aircraft Plant #1 CTD059831479	New England Aircraft Plant #1 manufactures jet aircraft engine blades and vanes.	Anti-rust compound Zyglo solution Fluorescent penetrant rinse waters Metal hydroxide sludge TPH TPH Waste oil Sodium chloride	1961 to present 1961 to present 1961 to present 1961 to present Unknown Unknown 1977 to present 1961 to present	1961 to 1981 1961 to 1981 1961 to 1981 1961 to 1980 Unknown Unknown Unknown Unknown	Two septic systems Two septic systems Two septic systems Eastern parking lot Loading dock area Air compressor area Waste oil ASTs ECM treatment shed
New England Aircraft Plant #2 CTD982710535	New England Aircraft Plant #2 manufactured jet aircraft engine parts.	Spent chromic acid (CrO_3) Waste solvents	1963 to 1976 1963 to 1976	1963 to 1976 1963 to 1976	Drywell Drywell
Roy Machinery and Sales CTD001143957	Roy Machinery performs general metal machining; paint spraying; cleaning; testing.	Unspecified industrial wastes Agitene	1957 to 1976 Unknown	1957 to 1976 Unknown	Septic system Ground west of building

Table 3

Summary of Substances and Source Areas Associated with Properties Located in the Farmington Industrial Park (concluded)

Property & CERCLIS No.	Type of Operation	Associated Substances	Years of Use and Storage	Years of Disposal	Source Areas
Mott Metallurgical Corp. CTD980524193	Mott manufacture sintered metallic filters.	1,1,1-TCA	1969 to 1975	1969 to 1975	Drywell
		methyl ethyl ketone (MEK)	1969 to 1975 1976 to 1981 1981 to present	1969 to 1975 Off-site disposal Off-site disposal	Drywell Two, 500-gallon USTs 1,000-gallon UST
		Acetone	1969 to 1975 1976 to 1981 1981 to present	1969 to 1975 Off-site disposal Off-site disposal	Drywell Two, 500-gallon USTs Drum storage area
		Propanol	1969 to 1975 1976 to 1981 1981 to present	1969 to 1975 Off-site disposal Off-site disposal	Drywell Two, 500-gallon USTs Drum storage area
		Waste machine oil	1979 to present	Off-site disposal	Drum storage area
		Phosphoric acid	1969 to 1975 1976 to 1981 1981 to present	1969 to 1975 Off-site disposal Off-site disposal	Drywell Two, 500-gallon USTs 1,000-gallon UST
		Nitric Acid	1969 to 1975 1976 to 1981 1981 to present	1969 to 1975 Off-site disposal Off-site disposal	Drywell Two, 500-gallon USTs 1,000-gallon UST
		Metal salts	1969 to 1975 1976 to 1981 1981 to present	1969 to 1975 Off-site disposal Off-site disposal	Drywell Two, 500-gallon USTs 1,000-gallon UST

WASTE/SOURCE SAMPLING

Between December 1986 and March 1987, CT DEP collected 13 soil samples to evaluate the Connecticut Spring property [62]. CT DEP samples were analyzed for VOCs; however, the exact analytical method used could not be determined from available file information. In addition, no known reference or QA/QC samples were collected. Three VOCs were detected in the CT DEP soil samples [1; 62]. PCE was detected in eleven of the samples at concentrations between 14 and 3,700 micrograms per liter (μg/L) [1; 62]. TCE was detected in three of the samples ranging in concentration from 20 to 95 μg/L, and cis-1,2-dichloroethylene (cis-1,2-DCE) was detected in two of the samples at 14 and 40 μg/L, respectively. No other substances were detected in the CT DEP soil samples. Complete analytical results and sample locations from the CT DEP sampling events are presented in Attachment A.

In July 1987, TRC collected six soil samples, including a reference and duplicate sample, to evaluate the Connecticut Spring property [62; 63]. Samples were analyzed for VOCs using EPA Methods 8010, 8015, and 8020. Two VOCs were detected in the TRC soil samples. PCE was detected between 1.1 and 240 times the reference sample laboratory detection limit [62; 63]. TCE was detected in two of the soil samples at 248 and 654 times the laboratory detection limit [62; 63].

In May and June 1988, TRC advanced seven soil borings and collected subsurface soil samples to further evaluate the Connecticut Spring property [63]. Samples were analyzed for VOCs using EPA Method 8010. Two VOCs were detected in the 1988 TRC soil samples. PCE was detected up to 600 times the reference sample concentration and 1,1,1-TCA was detected at 2.5 and 9.6 times the laboratory detection limit [63]. Complete analytical results and sample locations from TRC sampling events are presented in Attachment B.

In 1989, HRP completed a total of 16 borings and installed monitoring wells at each location [61]. Soil samples were collected continuously in the borings except at BR-2, BR-3, and BR-4, which were sampled at 5-foot intervals. Samples were collected between 0 and 44 feet below ground surface (bgs). Soil samples were analyzed for VOCs using EPA Method 8010 [61]. Three VOCs, PCE, TCE, and 1,1,1-TCA were detected; the highest concentration was 1,892 parts per million (ppm) for PCE [61]. Complete analytical results and sample locations from the HRP sampling event are presented in Attachment C.

Based on documented historic on-site spills and analytical results from on-site soil samples, an area of soil contamination measuring approximately 50,000 sq ft is assumed for the purpose of this SIP. The detection of PCE in on-site soil samples is consistent with the documented 1981 on-site spill and past use of this substance at the property [1]. In addition, the detection of chlorinated solvents in on-site soil samples is consistent with on-site manufacturing processes. Based on available file information, no other known on-site source sampling has occurred at the Connecticut Spring property.

GROUNDWATER PATHWAY

Prior to 1960, the Connecticut Spring property was used as farmland [1, p. 2]. Soil maps for Hartford County report the soil type at the Connecticut Spring property as Hinckley Merrimac, an excessively drained soil with sandy and gravely substratum on terraces [12]. Surficial geology of the area beneath the Connecticut Spring property has been mapped as glacial collapsed stratified drift deposits [12]. These deposits are associated with deltaic deposits comprised of stratified sand and gravel, overlying glacial till. The occurrence of sand and gravel in the deposits indicates that the overburden permeability at the property is moderate to high. The underlying glacial till is presumed to be present continuously beneath sand and gravel throughout the Pequabuck River Valley within a two-mile radius of the property, based on its occurrence in all of the boring logs for monitoring wells installed in the vicinity of Scott Swamp Brook and the Pequabuck River [14, Appendix 1].

In May and June 1988, TRC advanced seven soil borings and installed seven monitoring wells at the property. In addition, in 1989, HRP completed a total of 16 borings and installed monitoring wells at each location. Boring logs for the two events were not available in file information; however, the depth to groundwater at the property, according to HRP observations, ranges from 10.9 to 25.8 feet bgs [62; 63].

Bedrock geology beneath the property has been mapped as Triassic New Haven Arkose, which makes up a large part of the Central Lowlands of Connecticut. The New Haven Arkose is a reddish, poorly-sorted sandstone and conglomerate. This central region of Connecticut contains several large fault zones that strike approximately North 50° East, with dip angles near vertical [13]. Depth to bedrock beneath the Connecticut Spring property is estimated to be between 50 and 60 feet bgs. An inactive private groundwater production well, located approximately 0.75 miles southwest of the Connecticut Spring property is completed in bedrock at a depth of approximately 165 feet bgs. The well was noted to exist under flowing artesian conditions (with a potentiometric surface above the ground surface) by WESTON on April 17, 1995 [14, p. 48; 15]. The top of the overburden water table at this location is approximately 30 feet bgs [15]. These observations indicate that the potentiometric surface in the bedrock is greater than that in the overburden by at least 30 feet. Therefore, groundwater flow between the two units would tend to be from the higher potentiometric surface to the lower, in this case, from bedrock to overburden [14, pp. 21, 48-49; 15].

Overburden becomes much thicker, approximately 0.1 mile east of the Connecticut Spring property where a glaciolacustrine varved silt and clay unit, between 86 and 205 feet thick and one mile wide, occurs within the overburden. This layer partially separates unconfined and confined portions of the Pequabuck River Valley overburden aquifer [14, pp. 22, Figure 7]. Although the silt and clay layer strongly restricts groundwater flow between the two parts of the overburden aquifer, aquifer tests have demonstrated interconnection between the unconfined and confined parts of the overburden aquifer, in particular in the stratified drift deposits located north and west of the FIP and Johnson Avenue wells [14, p. 22]. The Connecticut Spring property is located above stratified drift deposits northwest of these wells, in an area noted to be a recharge area for the lower portion of the Pequabuck River Valley overburden aquifer [14, p. 22]. Further, since the silt and clay layer is not present beneath the Connecticut Spring property, the silt and clay layer does not meet the CERCLA definition of a confining layer [20, p. 51601; 16].

Typical hydraulic conductivities for sand and gravel range from 10^{-4} to 10^{-2} centimeters per second (cm/s), typical hydraulic conductivities for glacial till range from 10^{-6} to 10^{-4} cm/s, and typical hydraulic conductivities for fractured sedimentary rock are approximately 10^{-4} cm/s [20, p. 51601]. For the purposes of this report, the glacial till which underlies the Pequabuck River Valley overburden aquifer is considered to constitute a continuous, low-permeability layer which separates overburden and bedrock aquifers beneath the property and throughout the aquifer [20, p. 51601]. Further, the observed hydraulic gradient between the overburden and bedrock aquifers in the vicinity of the FIP indicates that groundwater flow between the two aquifers would be primarily from bedrock to overburden. While it is possible that contaminant flow from the overburden to the bedrock aquifer may occur under the overall groundwater flow regime if dense non-aqueous phase liquid is present, existing hydrogeological data, as well as analytical data support an aquifer discontinuity [16, p. 5; 14, pp. 21, 48-49].

The Pequabuck River Valley overburden aquifer, in the vicinity of Scott Swamp Brook, is bordered to the west by collapsed stratified drift, kame, and glacial till deposits, to the east by bedrock outcrops. The Pequabuck River Valley overburden aquifer begins at the Quinnipiac River Valley in the south, and terminates beneath the Farmington River in Avon, Connecticut [14, p. 22]. The direction of groundwater flow within the Pequabuck River Valley overburden aquifer during the pumping of the public water supply wells located southeast of the Connecticut Spring property was radially toward these wells. Beneath the Connecticut Spring property, the direction of groundwater flow is assumed to be east-southeast, flowing toward the FIP and Johnson Avenue wells [14, Figure 9]. Average rainfall for the Town of Farmington is 49.06 inches per year [10].

All or part of the following Connecticut cities and towns are located within four radial miles of the FIP properties: Bristol (population 60,640), Burlington (population 7,026), New Britain (population 72,513), Farmington (population 20,608), Plainville (population 17,197), and Southington (population 38,000) [17, pp. 63-64; 35; 36; 37; 38]. The nearest public well is located 0.28 miles southeast of the property. The estimated population served by public groundwater sources within four miles of the property is 70,917.

The Bristol Water Department (BWD) of the Town of Bristol operates two separate public water supplies. One is located in the western part of the town, and relies on combined groundwater and surface water sources located more than four radial miles and 15 downstream miles from the property [18, p. 50; 21; 22]. The second supply is located in the northeastern part of the town and serves 20,000 persons. The supply obtains water from four wells located within four miles of the property. BWD Well No. 2 is drilled in overburden 75 feet deep and is located approximately 2.42 miles southwest of the property, and supplies 50 percent of the total supply [18, p. 50; 22]. The other 50 percent of the supply (no further breakdown is available) is obtained from the three Mix Street Wells, which are overburden wells, 55 feet deep, and are located approximately 2.78 miles west of the property [18, p. 50; 22]. For the purposes of this report, the three Mix Street Wells are assumed to contribute equally to the system, and each serve 3,334 persons [38]. The remainder of the population of Bristol is presumed to rely on private drinking water wells and groundwater sources from outside of the four-mile radius to the property.

A small section of the southeast corner of the Town of Burlington is located within the four-mile radius. No major public water supplies have been identified in this area; however, there are two community water supplies in that area of Burlington: the Farmington Line West Condominium Well, 2.72 miles northwest of the property, as well as the Woodcrest Association Well, which is 2.8 miles northwest of the property. The wells serve 34 and 60 persons, respectively; no data regarding depths is available [19; 21; 26; 27]. The remainder of the Town of Burlington relies on private wells.

Four public water supplies provide drinking water to most of the residents of Farmington [28]. The New Britain Water Department (NBWD) supplies water to an estimated 90,677 persons, including residents of Farmington, Kensington, New Britain, Newington and Plainville. The supply is provided by seven groundwater wells and six reservoirs which are not located downstream of the FIP properties [18, p. 51; 39]. One pair of overburden groundwater wells, known as the White Bridge Wells and operated by the NBWD, is located approximately 2.22 miles west of the property [21; 39]. The White Bridge Wells provide 28.6 percent of the total annual water supply and serve 25,900 persons.

The Metropolitan District Commission (MDC) supplies water to some residents of Farmington, as well as other communities in the greater Hartford area. The supply is provided from reservoirs which are not located downstream of the FIP properties [18, pp. 35, 36; 28].

The Plainville Water Company (PWC) provides drinking water to residents of Farmington and Plainville. The PWC maintains a blended system of five overburden wells which serves a total of 20,000 people. Prior to distribution, water from these wells is air-stripped. The two PWC overburden wells located 0.43 and 0.47 miles southeast of the property are known as Johnson Avenue Wells Nos. 6 and 3, respectively, and account for 27.4 percent of the system's annual total water supply, and serve an estimated 5,480 persons [21]. These wells are screened in the lower portion of the Pequabuck River Valley overburden aquifer, at depths of 80 to 93 and 92 to 110 feet bgs, respectively [14, Appendix 1]. The three PWC wells located 2.28 miles southeast of the property are known as the Woodford Avenue Wells and supply 72.6 percent of the system's annual total water supply, serving an estimated 14,520 persons [18, p. 51; 22; 29; 30; 32]. These wells are also screened in the Pequabuck River Valley overburden aquifer, at a point up-gradient of the FIP area [18, p. 51; 14, Figures 3 and 5].

The UWC provides drinking water to many residents in Farmington. The UWC system consists of eight wells at four locations in Farmington. Of these eight wells, five are located greater than four radial miles from the property. None of these eight wells are completed in the Pequabuck River Valley overburden aquifer, although the Wells Acres Well, which is screened in bedrock, is located 0.45 miles northwest of the property [18, p. 51]. The Wells Acres Well was sampled by WESTON on July 12, 1995; the analytical results from the well are discussed in the Groundwater Pathway Section of this report [53, p. 16]. The UWC also maintains four wells which provide water to the FIP; named FIP Nos. 1 through 4. Available information suggests that this water is used for both manufacturing processes and potable purposes at the FIP. Several businesses in the FIP use bottled drinking water. The FIP wells serve an estimated 1,026 workers at businesses within the FIP [40]. The wells are located immediately southeast of the FIP (Figure 1B) [18, p. 35; 31; 39]. The annual contribution of each well to the system is based on 1994 annual production figures [21; 33]. All four of the wells are screened in the lower portion of the Scott Swamp Brook Valley overburden aquifer [14, pp. 3-4]. The UWC maintains the Connecticut Sand & Stone Well located in Farmington, 2.82 miles northeast of the property which serves an estimated 2,792 persons [21; 23; 31]. The UWC also maintains the Pondwood Well located in Farmington, approximately 2.84 miles northwest of the property which serves an estimated 406 persons [21; 23; 31].

The NBWD supplies water to some residents of New Britain, as well as Farmington, Kensington, Newington and Plainville. The supply is provided from six reservoirs which are not located downstream of the FIP properties [18, p. 51; 39]. Most of Plainville is provided drinking water by the PWC and the NBWD. The Cope Manor Rest Home maintains a bedrock well which provides drinking water to an estimated 92 patients and staff and is located approximately 1.52 miles southwest of the property [19; 34]. Ciccio Court Apartments, located approximately 3.3 miles south of the property, also maintains a well in Plainville serving an estimated 80 people [18, p. 35; 19].

Parts of Southington lie within four radial miles of the Connecticut Spring property, but there are no Southington public water supplies that are located within the four radial miles of the Connecticut Spring property. One community water supply is located approximately 3.7 miles south of the property at the Apple Valley Village Apartments, and serves an estimated 70 people [18, p. 50; 19; 26].

Table 4 summarizes public groundwater supply sources located within four radial miles of the Connecticut Spring property [18, pp. 35, 36, 50, 51; 19; 21; 35; 36; 37; 38].

Table 4

Public Groundwater Supply Sources within Four Radial Miles of Connecticut Spring & Stamping Company

Distance/ Direction from Site	Source Name	Location of Source	Estimated Population Served	Source Type
0.28 miles Southeast	UWC FIP Well No. 4	Plainville	477	1 overburden well
0.38 miles Southeast	UWC FIP Well No. 3	Plainville	547	1 overburden well
0.38 miles Southeast	UWC FIP Well No. 1	Farmington	2	1 overburden well
0.43 miles Southeast	UWC FIP Well No. 2	Farmington	0	1 overburden well
0.43 miles Southeast	PWC Johnson Avenue Well No. 6	Plainville	2,740	1 overburden well
0.45 miles Northwest	UWC Wells Acres	Farmington	457	1 bedrock well
0.47 miles Southeast	PWC Johnson Avenue Well No. 3	Plainville	2,740	1 overburden well
1.52 miles Southwest	Cope Manor	Plainville	92	1 bedrock well

Table 4

Public Groundwater Supply Sources within Four Radial Miles of Connecticut Spring & Stamping Company (concluded)

Distance/ Direction from Site	Source Name	Location of Source	Estimated Population Served	Source Type
2.22 miles West	NBWD White Bridge Wells	Bristol	25,900	2 overburden wells
2.28 miles Southeast	PWC Woodford Avenue Wells	Plainville	14,520	3 overburden wells
2.42 miles Southwest	BWD Well No. 2	Bristol	10,000	1 overburden well
2.72 miles Northwest	Farmington Line West Condominium	Burlington	34	Unknown
2.78 miles West	BWD Mix Street Wells	Bristol	10,000	3 overburden wells
2.80 miles Northwest	Woodcrest Association	Burlington	60	Unknown
2.82 miles Northeast	UWC CT Sand & Stone Well	Farmington	2,792	1 overburden well
2.84 miles Northwest	UWC Pondwood Well	Farmington	406	1 bedrock well
3.30 miles South	Ciccio Court	Plainville	80	Unknown
3.70 miles South	Apple Valley Village	Southington	70	Unknown

The nearest verified private drinking water well to the property is located approximately 1.5 miles north-northwest of the Connecticut Spring property on Washington Avenue in Farmington, Connecticut and serves an estimated three people [53]. The estimated population served by private groundwater sources within four miles of the property is 7,937.

The number of persons who rely on private groundwater supplies within a four-mile radius of the FIP was reported by CENTRACTS which estimates groundwater populations using equal distribution calculations of U.S. Census data identifying population, households and private water wells for "Block Groups" which lie wholly or in part within individual radial distance rings measured from potential sources on the Connecticut Spring property [11]. Because the CENTRACTS report estimates private well use in each block and no private wells have been identified less than 1.5 miles from the property, the population attributed to the 0 to 0.25, the 0.25 to 0.5, and the 0.5 to 1.0, mile rings in the CENTRACTS report has been shifted to the 1.0 to 2.0-mile distance ring. Table 5 summarizes public and private well users within four miles of the Connecticut Spring property [18, pp. 35, 36, 50, 51; 21; 53].

Table 5

Estimated Drinking Water Populations Served by Groundwater Sources within Four Radial Miles of Connecticut Spring & Stamping Company

Radial Distance from Connecticut Spring (miles)	Estimated Population Served by Private Wells	Estimated Population Served by Public Wells	Total Estimated Population Served by Groundwater Sources within the Ring
0.00 < 0.25	0	0	0
0.25 < 0.50	0	6,963	6,963
0.50 < 1.00	0	0	0
1.00 < 2.00	1,349	92	1,441
2.00 < 3.00	2,796	63,712	66,508
3.00 < 4.00	3,792	150	3,942
TOTAL	**7,937**	**70,917**	**78,854**

According to State file information, The Connecticut Department of Health Services (CT DHS) initially collected and analyzed samples from the four FIP wells and Johnson Avenue Well No. 3 in June 1975. Available records indicate that Johnson Avenue Well No. 6 was first sampled in June 1982.

Analytical results from the June 1975 sampling round of the four FIP wells and Johnson Avenue Well No. 3 indicated the presence of several VOCs at concentrations ranging from 20 to 1,000 parts per billion (ppb). The compounds present at the highest concentrations from the June 1975 sampling round included 1,1,1-TCA at 1,000 ppb, chloroform at 680 ppb, PCE at 640 ppb, and TCE at 430 ppb. The highest concentrations of 1,1,1-TCA, TCE, and chloroform were noted in samples collected from Johnson Avenue Well No. 3, and the highest concentration of PCE was detected in the sample collected from FIP Well No. 4.

Samples have been collected from the six affected wells intermittently from 1975 to the present, with the exception of Johnson Avenue Well No. 6, for which no analytical results are available prior to 1982 [33, p. 6]. A summary of these analytical results, through 1989, is included in Attachment D. The concentration of chlorinated organics in the wells has generally decreased since their discovery in 1975, but were still present as of the latest sampling round conducted in Spring 1995 [26; 27; 33, Attachment B]. The most recent analytical results available for the FIP wells and the Johnson Avenue wells are included in Attachment E.

Table 6 summarizes the historical results of sampling of the FIP and Johnson Avenue wells [1; 24; 25; 49; 67]. The first data column notes the highest concentration of the substance and the sampling date. The second data column records the concentration of the same substance as detected in the most recent sampling event, excluding groundwater sampling conducted as part of this SIP, in order to illustrate the trend of contamination.

Table 6

Summary of Substances Detected in Drinking Water Wells in the Vicinity of the Farmington Industrial Park

Well	Substance	Highest Concentration/Date (ppb)		Most Recent Concentration/Date (ppb)		MCL (ppb)
FIP No. 1	Chloroform	20	6/2/75	NS		---
	1,1,1-TCA	ND		NS		200
	TCE	200	6/2/75	NS		5
	PCE	ND		NS		5
FIP No. 2	Chloroform	60	6/2/75	NS		---
	1,1,1-TCA	ND		NS		200
	TCE	85	6/2/75	NS		5
	PCE	160	6/2/75	NS		5
FIP No. 3	Chloroform	97	6/2/75	ND	1/11/95	---
	1,1,1-TCA	46 *	3/20/80	4.1	1/11/95	200
	TCE	36	6/2/75	0.86	1/11/95	5
	PCE	73	6/2/75	1.2	1/11/95	5
FIP No. 4	Chloroform	77	6/2/75	ND	10/28/94	---
	1,1,1-TCA	25 *	2/29/80	4.9	10/28/94	200
	TCE	53	6/2/75	0.95	10/28/94	5
	PCE	640	6/2/75	1.5	10/28/94	5
Johnson Avenue Well No. 3	Chloroform	680	6/2/75	ND	1/17/95	---
	1,1,1-TCA	1,000	6/20/75	19.7	1/17/95	200
	TCE	900	7/22/75	4.9	1/17/95	5
	PCE	60	6/2/75	14.0	1/17/95	5
Johnson Avenue Well No. 6	Chloroform	ND		ND	1/17/95	---
	1,1,1-TCA	12.8	4/19/88	3.5	1/17/95	200
	TCE	34.8	9/6/88	21.0	1/17/95	5
	PCE	5.8	12/22/86	3.1	1/17/95	5

ND = Not Detected.
NS = Not Sampled.
* = A higher concentration of 1,1,1-TCA, 101 ppb, was detected in a composite sample of water from FIP Well Nos. 3 and 4 on October 3, 1983.
MCL = EPA Maximum Contaminant Level.

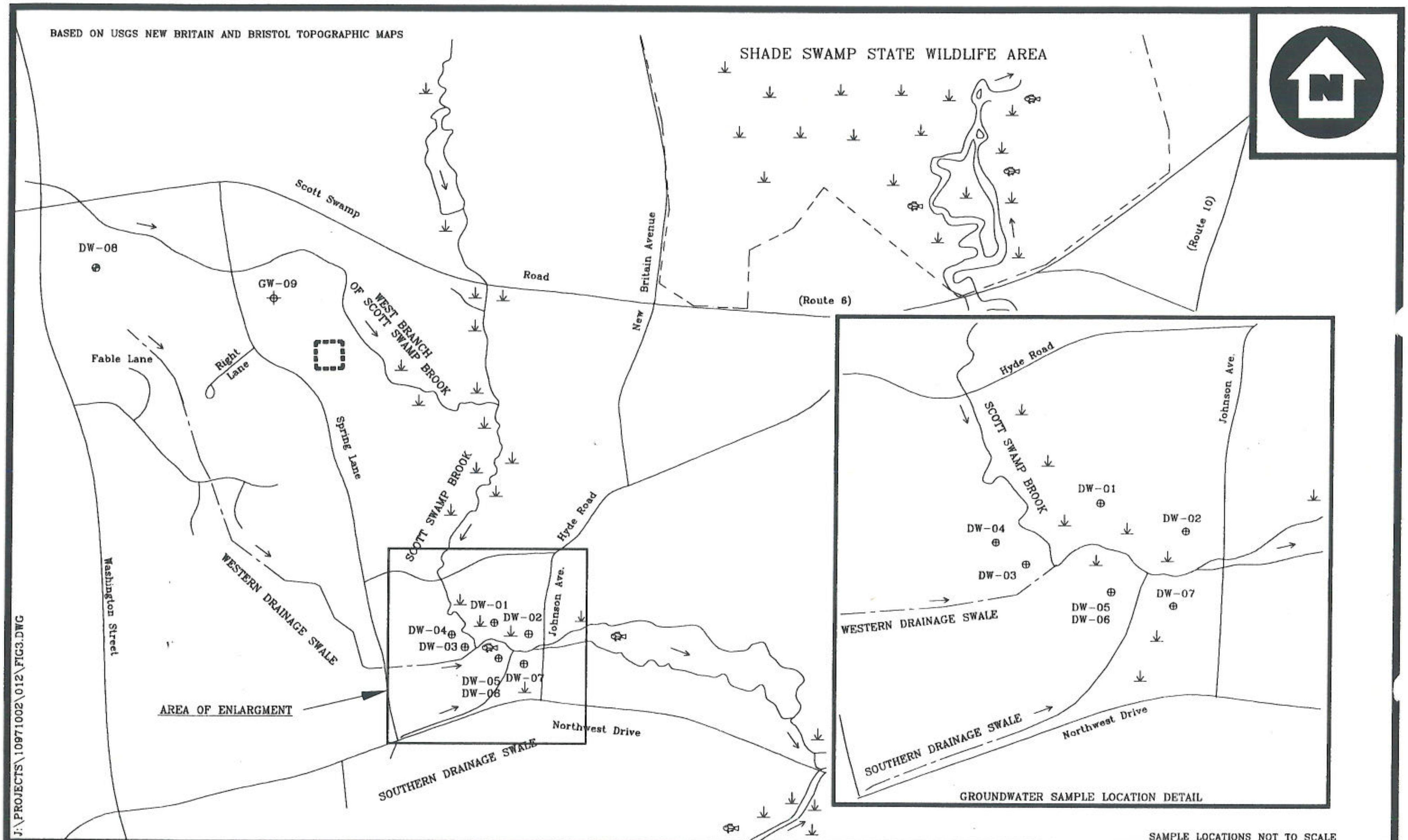
In May and June 1988, TRC and CT DEP collected groundwater samples from on-site monitoring wells to evaluate the Connecticut Spring property. Samples were analyzed for VOCs using EPA Method 8010 [1; 62; 63]. Results from the two sampling events reported elevated concentrations of eight VOCs in TRC groundwater samples and ten VOCs in the CT DEP groundwater samples [1; 62; 63]. CT DEP samples reported elevated concentrations of VOCs from 1 ppb for toluene to 140,000 ppb for PCE [1]. TRC samples reported similar results with concentrations ranging from 11 ppb for TCE to 486,000 ppb for PCE [62; 63]. Complete analytical results for the CT DEP sampling results are presented in Attachment A and sampling results from TRC sampling events are presented in Attachment B.

In 1989, Hubbard Hall contracted HRP to investigate the potential impact to on-site groundwater caused by the 1981 PCE spill. In October 1989, HRP installed 16 monitoring wells at the property. In April and June 1990, HRP collected groundwater samples from the on-site monitoring wells; the samples were analyzed for VOCs using EPA Method 8010. Elevated concentrations of three VOCs (PCE, TCE, and 1,1,1-TCA) were reported in HRP groundwater samples ranging from 0.001 to 5,200 ppm for PCE [61]. Complete analytical results for HRP sampling events are presented in Attachment C.

Elevated concentrations of substances detected in groundwater samples collected from on-site monitoring wells by CT DEP, TRC, and HRP are consistent with the historic use of these substances during production operations at the manufacturing building, as well as documented and alleged spills, including a 400 to 800-gallon PCE spill in 1981. Further, several groundwater samples reported PCE concentrations exceeding aqueous solubility limits (~150 ppm). As a result, it is probable that dense non-aqueous phase liquid (DNAPL) conditions exist at this property which would allow for contamination of the bedrock aquifer.

On July 12, 1995, WESTON collected eleven groundwater and drinking water samples from one monitoring well and eight public supply wells in the vicinity of the FIP, including a reference groundwater sample (GW-09), replicate and duplicate samples (GW-03/04), a rinsate blank sample (RB-02), and a trip blank sample (TB-01) (Figure 3) [53]. Samples were submitted through the EPA CLP for VOC, SVOC, pesticide/PCB, total metals and cyanide analyses. The VOC fraction of the groundwater samples was analyzed to lower detection limits by EPA Method 524.2 by the EPA Region I Regional Laboratory [53, pp. 39-40].

Groundwater sample GW-09, collected from monitoring well MW-1 on the New England Aircraft Plant No. 1 property, was selected as a reference sample because it is located upgradient of potential sources of groundwater contamination identified within the vicinity of the FIP, including the New England Aircraft Plant No. 1 property [48]. None of the groundwater or drinking water samples collected by WESTON were filtered prior to collection. Groundwater samples collected by WESTON appeared clear and free of visible solids [53]. Table 7 summarizes groundwater and drinking water samples collected during the WESTON FIP sampling event and Figure 3 depicts the groundwater and drinking water sample locations [53, pp. 39-40].



LEGEND

DRINKING WATER WELL (OVERBURDEN)	STATE WILDLIFE AREA PROPERTY LINE
DRINKING WATER WELL (BEDROCK)	WETLAND
MONITORING WELL (OVERBURDEN)	MANMADE STREAM/SWALE
FISHERY	STREAM/RIVER
	CONNECTICUT SPRING & STAMPING CORPORATION

GROUNDWATER SAMPLE LOCATION MAP

CONNECTICUT SPRING & STAMPING COMPANY
FARMINGTON INDUSTRIAL PARK PROPERTIES
FARMINGTON/PLAINVILLE, CONNECTICUT

WESTON
MANAGERS DESIGNERS/CONSULTANTS

FIGURE 3

Table 7

Groundwater and Drinking Water Sample Summary: Connecticut Spring & Stamping Company, Samples Collected by WESTON on July 12, 1995

Sample Location No.	Traffic Report No.	Time	Remarks	Sample Source
MATRIX: AQUEOUS				
DW-01	DAR73 AHF21 MAGL38	1015	Grab	Drinking water sample collected from FIP Well No. 1.
DW-02	DAR74 AHF22 MAGL39	1115	Grab	Drinking water sample collected from FIP Well No. 2.
DW-03	DAR75 AHF23 MAGL40	0945	Grab	Drinking water sample collected from FIP Well No. 3.
DW-04	DAR76 AHF24 MAGL41	1005	Grab	Drinking water sample collected from FIP Well No. 4.
DW-05	DAR77 AHF25 MAGL42	1400	Grab	Drinking water sample collected from Johnson Avenue Well No. 6.
DW-06	DAR78 AHF26 MAGL43	1400	Grab	Duplicate of sample DW-05 collected for quality control.
DW-07	DAR79 AHF27 MAGL44	1415	Grab	Drinking water sample collected from Johnson Avenue Well No. 3.
DW-08	DAR80 AHF28 MAGL45	0915	Grab	Drinking water sample collected from the UWC Wells Acres Well.
GW-09	DAR81 AHF29 MAGL46	1255	Grab	Groundwater sample collected from monitoring well MW-01 on the New England Aircraft Plant No. 1 property, as a reference sample.
TB-02	DAR83	0855	Grab	Trip Blank sample collected for quality control.
RB-02	DAR82 AHF33 MAGL50	0900	Grab	Rinsate Blank sample collected for quality control.

Table 8 is a summary of organic compounds and inorganic elements detected through CLP analyses of WESTON drinking water samples collected on July 12, 1995 [34; 41; 51; 53]. For each sample location, a compound or element is listed if it was detected at three times or greater than the reference sample concentration (GW-09). However, if the compound or element was not detected in the reference sample, the reference sample quantitation limit (SQL) (for organic analyses) or sample detection limit (SDL) (for inorganic analyses) is used as the reference value. These compounds or elements are listed if they occurred at a value equal to or greater than the reference sample's SQL or SDL and are designated by their approximate relative concentration above these values.

Table 8

Summary of Analytical Results, Drinking Water Sample Analysis for Connecticut Spring & Stamping Company: Samples Collected by WESTON on July 12, 1995

Sample Location	Compound/Element	Concentration	Reference Concentration	Comments
DW-01 DAR73 AHF21 MAGL38	**VOCS**			
	1,1,1-TCA	31 µg/L	2 U µg/L	15.50 × SQL
	TCE	4.2 µg/L	2 U µg/L	2.10 × SQL
	SVOCS			
	Naphthalene	2.4 µg/L	2 U µg/L	1.20 × SQL
DW-02 DAR74 AHF22 MAGL39	**VOCS**			
	1,1-DCE	2.1 µg/L	2 U µg/L	1.05 × SQL
	1,1,1-TCA	16 µg/L	2 U µg/L	8.00 × SQL
	TCE	4.9 µg/L	2 U µg/L	2.45 × SQL
	cis-1,2-DCE	6.6 µg/L	2 U µg/L	3.30 × SQL
	PCE	25 µg/L *	2 U µg/L	12.50 × SQL
DW-03 DAR75 AHF23 MAGL40	**VOCS**			
	1,1,1-TCA	4.9 µg/L	2 U µg/L	2.45 × SQL
DW-04 DAR76 AHF24 MAGL41	**VOCS**			
	cis-1,2-DCE	10 µg/L	2 U µg/L	5.00 × SQL
	PCE	2.7 µg/L	2 U µg/L	1.35 × SQL
DW-05 DAR77 AHF25 MAGL42	**VOCS**			
	TCE	13 µg/L *	2 U µg/L	6.50 × SQL
	cis-1,2-DCE	5.6 µg/L	2 U µg/L	2.80 × SQL
	1,2,3-Trichlorobenzene	2 µg/L	2 U µg/L	1.00 × SQL

Table 8

Summary of Analytical Results,
Drinking Water Sample Analysis for Connecticut Spring & Stamping Company:
Samples Collected by WESTON on July 12, 1995
(concluded)

Sample Location	Compound/Element	Concentration	Reference Concentration	Comments
DW-05 (concluded)	**SVOCS**			
	Naphthalene	4.3 μg/L	2 U μg/L	2.15 × SQL
DW-06 DAR78 AHF26 MAGL43	**VOCS**			
	TCE	13 μg/L *	2 U μg/L	6.50 × SQL
	cis-1,2-DCE	5.6 μg/L	2 U μg/L	2.80 × SQL
DW-07 DAR79 AHF27 MAGL44	**VOCS**			
	1,1,1-TCA	10 μg/L	2 U μg/L	5.00 × SQL
	TCE	2.7 μg/L	2 U μg/L	1.35 × SQL
	cis-1,2-DCE	2.3 μg/L	2 U μg/L	1.15 × SQL
	PCE	7.4 μg/L *	2 U μg/L	3.70 × SQL

U = The compound was analyzed for; but, was not detected. The associated numerical value is the SQL.
* = Concentration exceeds the MCL.

Several VOCs were detected at elevated concentrations in drinking water samples submitted for analysis; sample concentrations ranged from 1.0 to 15.5 times the SQL [51]. The following VOCs were detected at concentrations that exceed current MCLs; PCE at 25 and 7.4 μg/L in DW-02 and DW-07, respectively and TCE at 13 μg/L in DW-05 and DW-06 [51]. The EPA MCL for PCE is 5 μg/L. The concentrations of PCE detected in drinking water samples DW-02 and DW-07 are 5.0 and 1.5 times the MCL, respectively [49; 51]. The MCL for TCE is 5 μg/L. The concentration of TCE detected in drinking water samples DW-05 and DW-06 is 2.6 times the MCL in both samples [49; 51]. The SVOC naphthalene was also detected between 1.2 and 2.15 times the SQL [41]. Naphthalene is a component of petroleum fractions and may be considered a constituent of waste oils, cutting oils, and lubricating oils [56]. No pesticide/PCB or inorganic elements were detected in any of the WESTON drinking water samples collected to evaluate the property [34; 41; 51]. The complete analytical results of the 1995 WESTON sampling event are included in Attachment F.

Comparisons can be drawn between historical drinking water analytical results and the more recent analytical results to determine potential trends of contamination. The following is a description of analytical concentrations for certain contaminants detected in the FIP and Johnson Avenue Wells, including the date of a contaminant's highest concentration in a particular well and current status of the well with respect to the contaminant.

Chloroform

The highest concentration of chloroform in FIP Well No. 1 was detected at 20 µg/L on June 2, 1975. Analytical results from the WESTON sampling event, conducted on July 12, 1995, indicated that chloroform was not present above the detection limits in this well [1; 24; 25; 51].

The highest concentration of chloroform in FIP Well No. 3 was detected at 97 µg/L on June 2, 1975. Analytical results from January 11, 1995, indicated that the concentration of chloroform in this well had diminished to a non-detectable value. Results from the WESTON sampling event also indicate a non-detectable value of chloroform in FIP Well No. 3 [1; 24; 25; 51].

The highest concentration of chloroform in FIP Well No. 4 was detected at 77 µg/L on June 2, 1975. Analytical results from October 28, 1994, indicated that the concentration of chloroform in this well had diminished to a non-detectable value. Results from the WESTON sampling event also indicate a non-detectable value of chloroform in FIP Well No. 4 [1; 24; 25].

The highest concentration of chloroform in Johnson Avenue Well No. 3 was detected at 680 µg/L on June 2, 1975. Analytical results from January 17, 1995, indicated that the concentration of chloroform in this well had diminished to a non-detectable value. Results from the WESTON sampling event, on July 12, 1995, also indicated a non-detectable value of chloroform in Johnson Avenue Well No 3. Chloroform has not been detected above detection limits in Johnson Avenue Well No. 6 [1; 24; 25; 51].

Based on the analytical results, it appears that the presence of chloroform in the FIP and Johnson Avenue Wells may have been an isolated incident. Chloroform does not appear to be a continuing source of contamination in the FIP and Johnson Avenue wells. Based on the detection of elevated concentrations of chloroform in CT DEP groundwater sampling results used to evaluate the Connecticut Spring property, chloroform may be considered attributable to the Connecticut Spring property for the purposes of this SIP.

1,1,1-Trichloroethane

Prior to the WESTON sampling event on July 12, 1995, 1,1,1-TCA had not been detected in FIP Well Nos. 1 or 2. However, analytical results from the WESTON sampling event indicate that 1,1,1-TCA is present in FIP Well No. 1 at 31 µg/L and FIP Well No. 2 at 16 µg/L [1; 24; 25; 51]. The highest concentration of 1,1,1-TCA in FIP Well No. 3 was detected at 46 µg/L on March 20, 1980. On January 11, 1995, the concentration of 1,1,1-TCA had diminished to 4.1 µg/L. The WESTON sampling event revealed that the 1,1,1-TCA concentration has slightly increased from January 11, 1995, to 4.9 µg/L in FIP Well No. 3 [1; 24; 25; 51].

The highest concentration of 1,1,1-TCA in FIP Well No. 4 was detected at 25 µg/L on February 29, 1980. On October 28, 1994, the concentration of 1,1,1-TCA had decreased to 4.9 µg/L. The WESTON sampling event indicated that the 1,1,1-TCA concentration had diminished below detectable limits in FIP Well No. 4 [1; 24; 25; 51].

The highest concentration of 1,1,1-TCA in Johnson Avenue Well No. 3 was detected at 1,000 μg/L on June 20, 1975. This concentration exceeds the MCL for 1,1,1-TCA (established at 200 μg/L) five times. A January 17, 1995 sampling event indicated that this concentration had decreased to 19.7 μg/L, substantially below the MCL. A 1,1,1-TCA concentration of 10 μg/L was detected in Johnson Avenue Well No. 3 by WESTON during the July 12, 1995 sampling event [1; 24; 25; 51].

The highest concentration of 1,1,1-TCA in Johnson Avenue Well No. 6 was detected at 12.8 μg/L on April 19, 1988. A January 17, 1995 sampling event indicated that this concentration had decreased to 3.5 μg/L. The WESTON sampling event indicated that the 1,1,1-TCA concentration had diminished below detectable limits in Johnson Avenue Well No. 6 [1; 24; 25; 51].

Based on the analytical results, it appears that the presence of 1,1,1-TCA in FIP Wells No. 1 and 2 may be the result of an accumulation of the contaminant in the overburden material, despite a 15-minute purge prior to sample collection. These two wells are used for back-up purposes and, at the time of sample collection on July 12, 1995, had not been pumping for several weeks [1; 24; 25; 51; 53]. The concentrations of 1,1,1-TCA in the remaining wells have illustrated steady declines over time, with the exception of FIP Well No. 3, which displayed a slightly elevated concentration.

Based on prior analytical data from on-site samples collected by CT DEP, TRC, and HRP, 1,1,1-TCA may be considered attributable to the Connecticut Spring property for the purposes of this SIP. 1,1,1-TCA may degrade in soils and groundwater to 1,1-DCE, 1,1-DCA, cis-1,2-DCE, chloroethane, vinyl chloride, and acetic acid [56; 57]. The degradation of 1,1,1-TCA to 1,1-DCE, 1,1-DCA, cis-1,2-DCE, and chloroethane may explain the presence of these substances in samples collected to evaluate the property.

Trichloroethylene

The highest concentration of TCE in FIP Well No. 1 was detected at 200 μg/L on June 2, 1975. This concentration exceeds the MCL for TCE (established at 5 μg/L) by 40 times. Analytical results from the WESTON sampling event indicated that the concentration of TCE in FIP Well No. 1 has diminished to 4.2 μg/L [1; 24; 24; 51]. The highest concentration of TCE in FIP Well No. 2 was detected at 85 μg/L on June 2, 1975. This concentration exceeds the MCL for TCE by 17 times. Analytical results from the WESTON sampling event indicate that the concentration of TCE in FIP Well No. 2 has diminished to 4.9 μg/L [1; 24; 25; 51].

The highest concentration of TCE in FIP Well No. 3 was detected at 36 μg/L on June 2, 1975. This concentration exceeds the MCL for TCE by more than seven times. On January 11, 1995, the concentration of TCE was detected at 0.86 μg/L in this well. Analytical results from the WESTON sampling event indicate that the concentration of TCE in FIP Well No. 3 has further diminished to below detectable levels [1; 24; 25; 51].

The highest concentration of TCE in FIP Well No. 4 was detected at 53 μg/L on June 2, 1975. This concentration exceeds the MCL for TCE by more than ten times. On October 28, 1994, the concentration of TCE was detected at 0.95 µg/L in this well. Analytical results from the WESTON sampling event indicate that the concentration of TCE in FIP Well No. 4 has further diminished to below detectable levels [1; 24; 25; 51].

The highest concentration of TCE in Johnson Avenue Well No. 3 was detected at 900 µg/L on July 22, 1975. This concentration exceeds the MCL for TCE by 180 times. On January 17, 1995 the concentration of TCE was detected at 4.9 µg/L in this well. Analytical results from the WESTON sampling event indicate that the concentration of TCE in Johnson Avenue Well No. 3 has further diminished to 2.7 µg/L [1; 24; 25; 51].

The highest concentration of TCE in Johnson Avenue Well No. 6 was detected at 34.8 µg/L on September 6, 1988. This concentration exceeds the MCL for TCE by nearly seven times. On January 17, 1995, the concentration of TCE was detected at 21.0 µg/L in this well. Analytical results from the WESTON sampling event indicate that the concentration of TCE in Johnson Avenue Well No. 6 has further diminished to 13 µg/L. Despite the steady decline of TCE in this well, the current concentration exceeds the MCL by more than two times [1; 24; 25; 51].

The concentrations of TCE in the FIP and Johnson Avenue Wells have consistently displayed steady declines over time. Concentrations which were significantly above the MCL, have diminished to below the MCL, with the exception of Johnson Avenue Well No. 6, which still exceeds the MCL greater than two times.

For the purpose of this SIP, the detected concentrations of TCE may be considered attributable to the Connecticut Spring property since this substance has been used and generated as a waste during production operations at the manufacturing building. In addition, elevated concentrations of TCE have been detected in samples collected to evaluate the property by CT DEP, TRC, and HRP. TCE may degrade in soils and groundwater to cis-1,2-DCE and vinyl chloride [56; 57]. The degradation of TCE to cis-1,2-DCE may explain the presence of this substance in samples collected to evaluate the property.

Tetrachloroethylene

PCE has not been previously detected in FIP Well No 1. The highest concentration of PCE in FIP Well No. 2 was detected at 160 µg/L on June 2, 1975. This concentration exceeds the MCL for PCE (established at 5 µg/L) by 32 times. The WESTON sampling event revealed that PCE has decreased to 25 µg/L in this well. This concentration still exceeds the MCL by five times [1; 24; 25; 51].

The highest concentration of PCE in FIP Well No. 3 was detected at 73 µg/L on June 2, 1975. On January 11, 1995, the concentration of PCE in this well had dropped to 1.2 µg/L. The WESTON sampling event indicated that PCE was not detected above detection limits in FIP Well No. 3 [1; 24; 25; 51].

The highest concentration of PCE in FIP Well No. 4 was detected at 640 µg/L on June 2, 1975, at 128 times the MCL. As of October 28, 1994, the concentration had dropped to 1.5 µg/L. The

July 12, 1995 WESTON sampling event revealed that the concentration of PCE had raised slightly to 2.7 µg/L. Despite the increase, the concentration remains below the MCL [1; 24; 25; 51].

The highest concentration of PCE in Johnson Avenue Well No. 3 was detected at 60 µg/L on June 2, 1975, at twelve times the MCL. As of January 17, 1995, this concentration had decreased to 14.0 µg/L. The WESTON sampling event indicated that the concentration of PCE in Johnson Avenue Well No. 3 was still above the MCL, at 7.4 µg/L [1; 24; 25; 51].

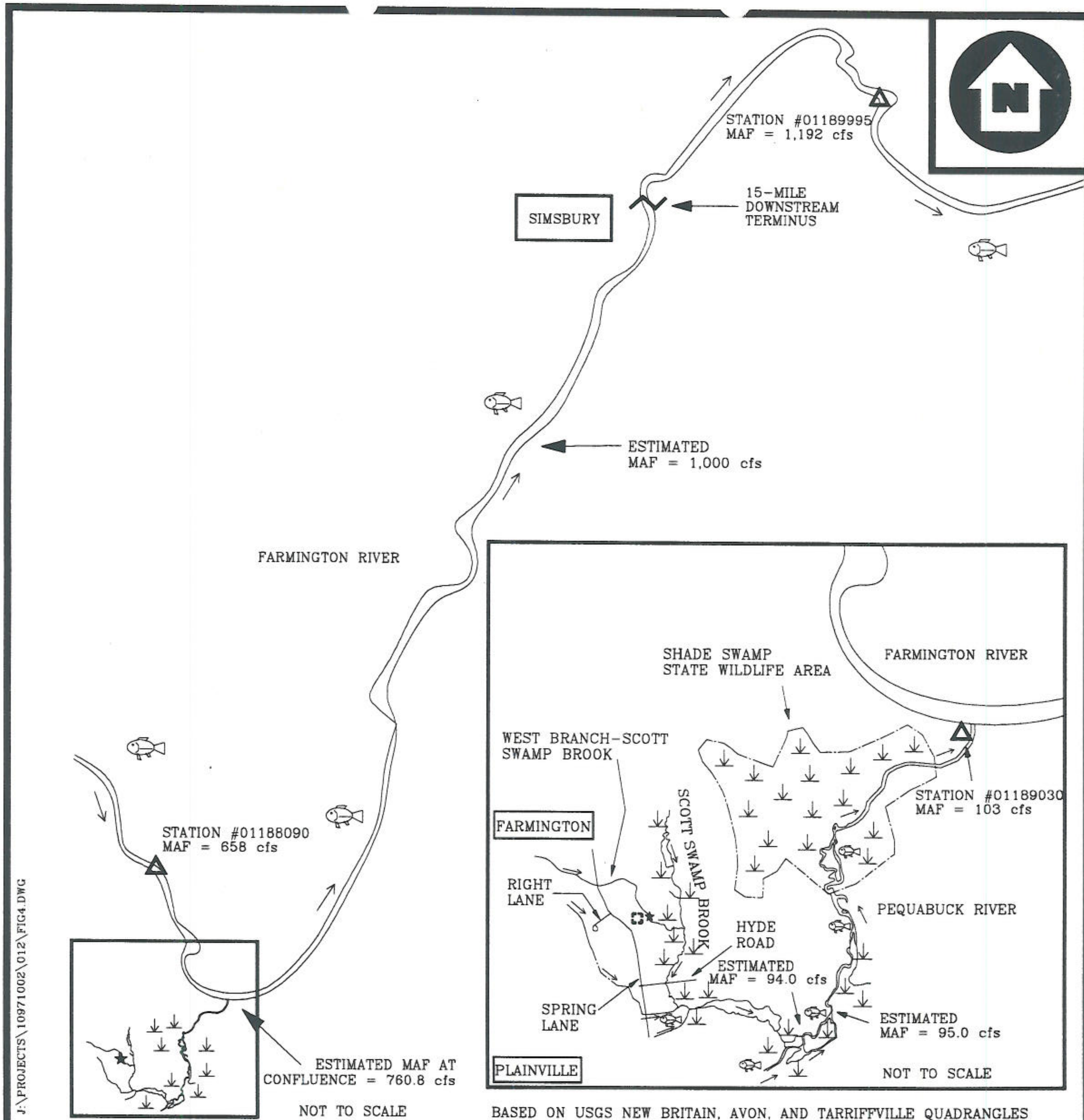
The highest concentration of PCE in Johnson Avenue Well No. 6 was detected at 5.8 µg/L on December 22, 1986, slightly above the MCL. As of January 17, 1995, this concentration had decreased to 3.1 µg/L. The WESTON sampling event indicated that the concentration of PCE in Johnson Avenue Well No. 6 had decreased to below detection limits [1; 24; 25; 51]. In general, PCE concentrations have steadily declined over the years in the FIP and Johnson Avenue Wells; however, two of the drinking water wells, FIP Well No. 2 and Johnson Avenue Well No. 3, still contain concentrations of PCE above the MCL.

For the purpose of this SIP, PCE may be considered attributable to the Connecticut Spring property since this substance has been used and generated during on-site operations. Further, NUS/FIT documented the 1981 spill of approximately 400 to 800 gallons of waste PCE to the ground along the eastern portion of the manufacturing building. In addition, elevated concentrations of PCE have been detected in samples collected by CT DEP, TRC, and HRP to evaluate the property. PCE may degrade in soils and groundwater to TCE, cis-1,2-DCE, and vinyl chloride [56; 57]. The degradation of PCE to TCE and cis-1,2-DCE may explain the presence of these substances in samples collected to evaluate the property.

SURFACE WATER PATHWAY

The Connecticut Spring property slopes gradually from the northwest to the southeast [3; 4; 6]. Overall surface water runoff is directed to the southeast toward the West Branch of Scott Swamp Brook [4]. The northern parking lot has two storm water catch basins which discharge to a drainage ditch and retention pond southwest of the manufacturing building [3; 6]. The drainage ditch receives the discharge from the northwest parking lot in addition to non-contact air conditioning and air compressing cooling water [3]. The drainage ditch slopes south to the retention pond and then bends east around the southern parking lot where it ultimately discharges to the probable point of entry (PPE) along the West Branch of Scott Swamp Brook, located approximately 150 feet east of the manufacturing building [3; 4].

The West Branch of Scott Swamp Brook continues southeast approximately 0.5 miles and discharges into Scott Swamp Brook, which then travels approximately 1.4 miles southeast to the Pequabuck River. The Pequabuck River flows approximately 2.32 miles north through the Shade Swamp State Wildlife Area and ultimately discharges to the Farmington River [59]. The 15-mile downstream point from the Connecticut Spring property is located in the vicinity of the Route 315 bridge crossing the Farmington River in Simsbury, Connecticut (Figure 4) [59]. Table 9 summarizes the characteristics of water bodies within 15-downstream miles of the Connecticut Spring property [35; 36; 37; 38; 47; 52; 59].



LEGEND

- ★ PPE TO SURFACE WATER
- FISHERY
- △ USGS GAUGING STATION
- RIVER/STREAM
- MANMADE STREAM/SWALE
- CONNECTICUT SPRING AND STAMPING CORPORATION
- WETLANDS
- FLOW DIRECTION

SURFACE WATER MIGRATION ROUTE

CONNECTICUT SPRING & STAMPING COMPANY
FARMINGTON, CONNECTICUT

WESTON
MANAGERS DESIGNERS/CONSULTANTS

FIGURE 4

Table 9

Water Bodies Along the 15-Mile Downstream Pathway from Connecticut Spring & Stamping Company

Surface Water Body	Descriptor[a]	Length of Reach (miles)	Flow Characteristics (cfs)[b]	Length of Wetlands (miles)
West Branch of Scott Swamp Brook	Minimal stream	0.5	< 7.2	0.0
Scott Swamp Brook	Minimal stream	1.4	< 7.2	0.2
Pequabuck River	Small to moderate stream	1.54	94.0 to 100	1.2
Pequabuck River	Moderate to large stream	0.78	100 to 103	1.2
Farmington River	Moderate to large stream	9.23	761 to 1,000	0.1
Farmington River	Large stream to river	1.55	1,000 to 1,080	-

[a] = Minimal stream. Small to moderate steam. Moderate to large stream. Large stream to river. Very large river. Coastal tidal waters. Shallow ocean zone or Great Lake. Deep ocean zone or Great Lake. Three-mile mixing zone in quiet flowing river.

[b] = Cubic feet per second.

No known drinking water intakes are located within 15 downstream miles of the Connecticut Spring property [18, p. 51; 42; 47; 59]. Scott Swamp Brook (downstream of Hyde Road in Farmington, Connecticut) and the Pequabuck River are considered the nearest fisheries, although neither water body is stocked (Figure 4) [18, p. 14-15; 42; 60]. The Farmington River is one of Connecticut's premier trout fisheries. It is stocked by the State of Connecticut with trout and Atlantic Salmon at locations upstream and downstream of Farmington. The segment of the Farmington River downstream of the Connecticut Spring property is classified as a warm-water fishery by CT DEP, which is currently attempting to restore the Atlantic Salmon to the river [60]. None of the fisheries downstream of the Connecticut Spring property have been closed.

A number of endangered/threatened species have been identified within four radial miles of the Connecticut Spring property, but available information does not indicate whether these environments are located along the downstream surface water drainage route from the property [54; 55]. However, the Shade Swamp State Wildlife Area, located along the Pequabuck River approximately 1.5 to 2.3 miles downstream from the Connecticut Spring property, is noted by the CT DEP as containing sensitive environments (Figure 4) [54; 55]. According to wetland inventory maps, the nearest wetland is located along Scott Swamp Brook approximately 0.5 miles downstream of the PPE where the West Branch of Scott Swamp Brook discharges to Scott Swamp Brook [36]. Table 10 summarizes sensitive environments located within 15 downstream miles of the Connecticut Spring property [52; 54; 55].

Table 10

Sensitive Environments Located Along the 15-Mile Downstream Pathway from Connecticut Spring & Stamping Company

Sensitive Environment Name	Sensitive Environment Type	Water Body	Downstream Distance from PPE	Flow Rate at Environment
West Branch Scott Swamp Brook	Protected under Clean Water Act	West Branch Scott Swamp Brook	0 miles	<4 cfs
Shade Swamp State Wildlife Area	State Wildlife Management Area	Pequabuck River	1.5 miles	96 cfs
Sandplain Gerardia (*Agalinis acuta*)	State-endangered species	Pequabuck River	1.5 miles	96 cfs
New England Grape (*Vitis novae-angliae*)	State species of Special Concern	Pequabuck River	1.5 miles	96 cfs

Between December 1986 and March 1987, CT DEP collected 21 surface water samples from the West Branch of Scott Swamp Brook [1]. CT DEP samples were analyzed for VOCs; however, the exact analytical method used could not be determined from available file information and no known reference or QA/QC samples were collected. Eight VOCs were detected in surface water samples. VOCs were detected in surface water samples ranging in concentration from 1 μg/L (TCE) to 300 μg/L (PCE) [1]. Complete analytical results and sample locations from the CT DEP sampling events are presented in Attachment A.

In July 1987, TRC collected four surface water samples from the West Branch of Scott Swamp Brook, including reference and duplicate samples [62]. Samples were analyzed for VOCs using EPA Method 601. The analytical results reported elevated concentrations of seven VOCs. The concentrations of PCE ranged from 7 to 38.5 times the reference sample concentrations [62]. Elevated concentrations of 1,1,1-TCA ranged from 6.3 to 34.5 times the laboratory detection limit. Reported concentrations of TCE ranged from 1.6 to 18 times the laboratory detection limit [62]. Elevated concentrations of 1,2-DCA ranged from 1.4 to 1.7 times the laboratory detection limit [62]. Elevated concentrations of 1,1-DCA ranged from 7.9 to 10.5 times the laboratory detection limit [62]. Reported concentrations of 1,1-DCE ranged from 12.3 to 15.3 times the laboratory detection limit [62]. Elevated concentrations of trans-1,2-dichloroethylene ranged from 4.5 to 30 times the laboratory detection limit [62].

In June and August 1990, HRP collected twelve surface water samples from the West Branch of Scott Swamp Brook. The samples were analyzed for VOCs using EPA Method 601/8010. The results indicated that every sample, except SW-1 and SW-2 exhibited elevated concentrations of the VOCs PCE, TCE, and 1,1,1-TCA [61]. Surface water samples SW-1 and SW-2 were reportedly collected upstream as reference locations. Elevated concentrations of VOCs ranged from 1 ppb (TCE) to 109,132 ppb (PCE) [61].

FIP Evaluation

The FIP properties for which WESTON is performing SIPs are a mixture of laboratories, metal working, and machine shops. Processes which are common within the FIP and vicinity include laboratory work, metal working (cutting, milling, drilling, lathing, and grinding), degreasing, painting, metal plating, and machinery assembly. Various FIP properties being investigated by WESTON have, at one time, used chlorinated solvents in processes at their facilities, primarily for the purpose of metal degreasing prior to finishing. Prior to circa 1980, public sewer service was not available in the FIP; sanitary waste in the FIP was discharged to on-site septic systems, drywells, or some combination of these systems. Wastewaters generated from on-site processes, often containing solvents, chlorinated solvents, or inorganic elements, were often discharged to these same on-site disposal systems. Several properties disposed larger amounts of wastewater or non-contact cooling water directly to Scott Swamp Brook, its tributaries, or drainage systems which lead to Scott Swamp Brook.

After 1980, several FIP properties filed with EPA Region I under the requirements of RCRA as generators of hazardous waste. Under the RCRA program, CT DEP inspected these facilities every few years to verify compliance with hazardous waste disposal regulations. In general, on-site disposal of hazardous wastes ceased throughout the FIP between 1980 and 1983, when public sanitary sewer service was provided to the FIP properties, and wastes were diluted and discharged to this system.

Based on topographic surveys conducted by the Town of Farmington, as well as WESTON field observations, overland flow from the FIP properties travels via storm drains/drainage swales, intermittent/perennial streams, or directly to Scott Swamp Brook. Approximately 0.8 miles downstream of the FIP, Scott Swamp Brook joins the Pequabuck River, which is a fishery (Figure 4). Approximately 1.5 miles downstream of the FIP, the Pequabuck River enters the Shade Swamp Wildlife Management Area, which is an extensive alluvial swamp and habitat for a Federally-endangered species and a State species of special concern.

On July 12, 1995, WESTON collected 2 surface water and 21 sediment samples, including trip blank and equipment blank samples from the vicinity of the FIP to evaluate the surface water pathway. Sampling locations were selected based on the location of each property within the FIP, and to document, when possible, actual contamination from individual properties to the surface water pathway, including target fisheries and sensitive environments. Samples were submitted through the EPA CLP for VOC, SVOC, pesticide/PCB, total metals and cyanide analyses [53, pp. 39-40]. Table 11 summarizes sediment and surface water samples collected by WESTON on July 12, 1995 from the vicinity of the FIP to evaluate the surface water pathway and Figure 5 depicts WESTON sample locations [53, pp. 39-40].

Table 11

Sediment and Surface Water Sample Summary: Farmington Industrial Park Properties, Samples Collected by WESTON on July 12, 1995

Sample Location No.	Traffic Report No.	Time	Remarks	Sample Source
MATRIX: SEDIMENT				
SD-01	AHF02 MAGL19	0900	Grab (0 to 8 in.)	Sediment sample collected from the Shade Swamp Wildlife Area, 100 yards north of the Scott Swamp Road bridge over the Pequabuck River.
SD-02	AHF03 MAGL20	0925	Grab (0 to 8 in.)	Sediment sample collected to document potential contamination entering the Pequabuck River via an unnamed stream near Pequabuck Crossing.
SD-03	AHF04 MAGL21	0915	Grab (0 to 6 in.)	Sediment sample collected from the downstream discharge point from Scott Swamp Brook to the Pequabuck River (MS/MSD).
SD-04	AHF05 MAGL22	0915	Grab (0 to 6 in.)	Duplicate of sample SD-03 collected for quality control.
SD-05	AHF06 MAGL23	1000	Grab (0 to 6 in.)	Sediment sample collected upstream of the confluence of Scott Swamp Brook and the Pequabuck River, immediately downstream of the Northwest Drive bridge over the Pequabuck River.
SD-06	AHF07 MAGL24	1005	Grab (0 to 6 in.)	Sediment sample collected upstream of the confluence of Scott Swamp Brook and the Pequabuck River, immediately downstream of the Northwest Drive bridge over the Pequabuck River.
SD-07	AHF08 MAGL25	1025	Grab (0 to 8 in.)	Sediment sample collected from wetlands along Scott Swamp Brook, downstream of its confluence with the southern drainage swale.
SD-08	AHF09 MAGL26	1115	Grab (0 to 8 in.)	Sediment sample collected from wetlands along Scott Swamp Brook, downstream of its confluence with the western drainage swale.
SD-09	AHF10 MAGL27	1137	Grab (0 to 6 in.)	Sediment sample collected from wetlands along Scott Swamp Brook, approximately 450 feet upstream of location SD-08.
SD-10	AHF11 MAGL28	1135	Grab (0 to 6 in.)	Sediment sample collected from wetlands along Scott Swamp Brook, downstream of its confluence with the west branch of Scott Swamp Brook, due west of the northern edge of the EBM building.

Table 11

Sediment and Surface Water Sample Summary: Farmington Industrial Park Properties, Samples Collected by WESTON on July 12, 1995 (continued)

Sample Location No.	Traffic Report No.	Time	Remarks	Sample Source
SD-11	AHF12 MAGL29	1220	Grab (0 to 6 in.)	Sediment sample collected from wetlands along the west branch of Scott Swamp Brook, at the point where overland runoff from the Connecticut Spring and Stamping property enters the brook.
SD-12	AHF13 MAGL30	1300	Grab (0 to 6 in.)	Sediment sample collected from wetlands along Scott Swamp Brook, downstream of its confluence with a small tributary, 20 feet south of sample SD-13.
SD-13	AHF14 MAGL31	1310	Grab (0 to 6 in.)	Sediment sample collected from wetlands along Scott Swamp Brook, downstream of its confluence with a small tributary.
SD-14	AHF15 MAGL32	1420	Grab (0 to 6 in.)	Sediment sample collected from the west branch of Scott Swamp Brook, 50 feet upstream of the point where overland runoff from the New England Aircraft Plant No. 1 property enters the brook.
SD-15	AHF16 MAGL33	1430	Grab (0 to 6 in.)	Sediment sample collected from the west branch of Scott Swamp Brook, 75 feet upstream of the point where overland runoff from the New England Aircraft Plant No. 1 property enters the brook.
SD-16	AHF17 MAGL34	1432	Grab (6 to 8 in.)	Sediment sample collected from the western drainage swale, behind the residence at 8 Fable Lane.
SD-17	AHF18 MAGL35	1440	Grab (6 to 8 in.)	Sediment sample collected from the western drainage swale, behind the residence at 6 Fable Lane.
SD-18	AHF19 MAGL36	1241	Grab (6 to 8 in.)	Sediment sample collected from the southern drainage swale, 125 feet east of the intersection of Spring Lane and Northwest Drive.
SD-19	AHF20 MAGL37	1251	Grab (6 to 8 in.)	Sediment sample collected from the southern drainage swale, 175 feet east of the intersection of Spring Lane and Northwest Drive.

Table 11

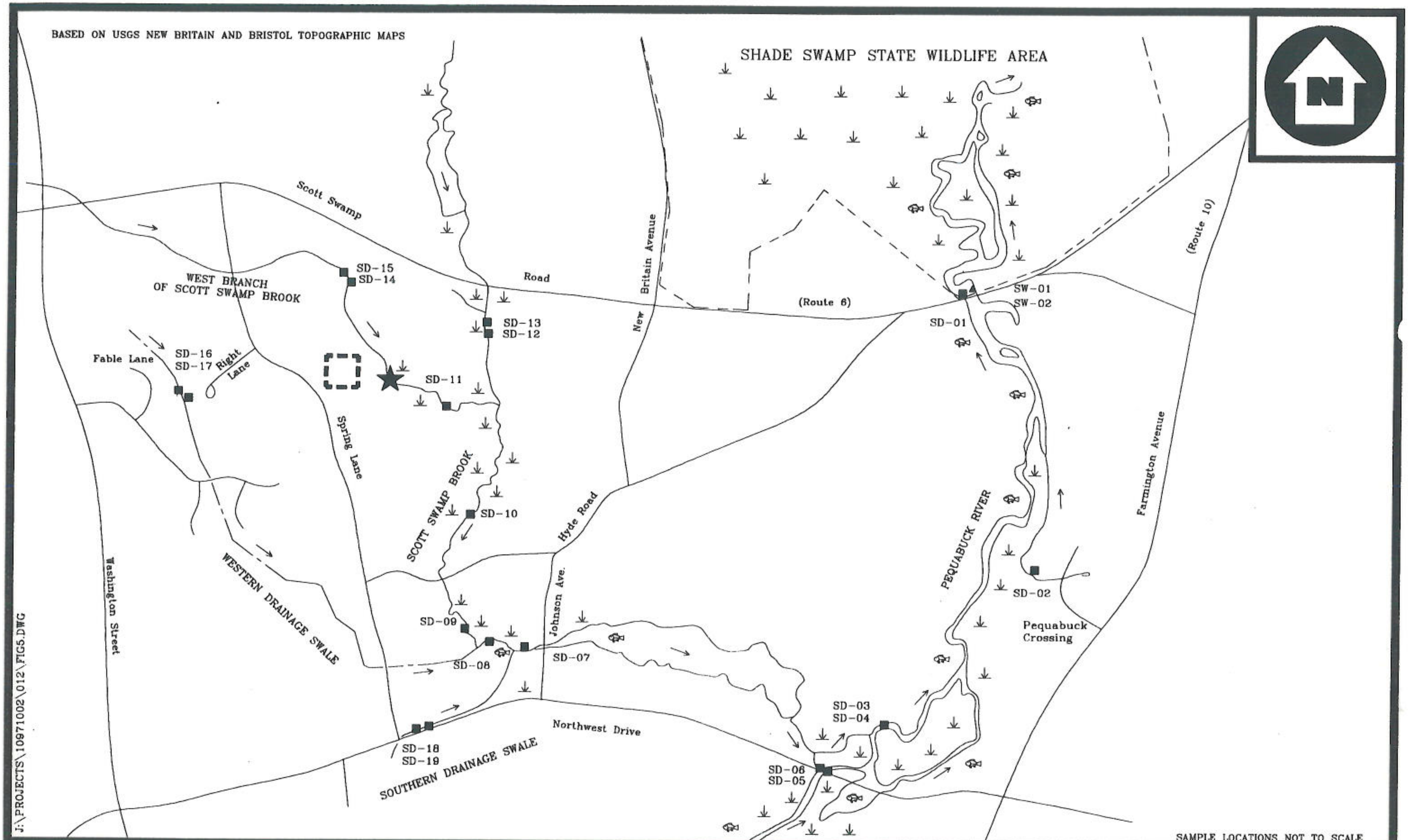
Sediment and Surface Water Sample Summary: Farmington Industrial Park Properties, Samples Collected by WESTON on July 12, 1995 (concluded)

Sample Location No.	Traffic Report No.	Time	Remarks	Sample Source
MATRIX: AQUEOUS				
SW-01	AHF30 MAGL47	0850	Grab	Surface water sample collected from the Pequabuck River in the Shade Swamp Wildlife Area, 100 yards north of the Scott Swamp Road bridge.
SW-02	AHF31 MAGL48	0850	Grab	Duplicate of sample SW-01 collected for quality control.
TB-01	AHF34	0850	Grab	Trip blank sample collected for quality control.
RB-01	AHF32 MAGL50	0920	Grab	Rinsate blank sample collected for quality control.

MS/MSD = Matrix Spike/Matrix Spike Duplicate.

During the FIP WESTON environmental sampling event, eleven reference sediment samples were collected to determine reference conditions for the area in the vicinity of the FIP. The reference sample locations were selected based on their upstream location from potential targets (Figure 5). Due to the variable concentrations of inorganic elements in natural sediments, reference samples were generally collected in pairs. In addition, WESTON collected eight target sediment samples to evaluate whether releases to surface water have occurred to Scott Swamp Brook or to the Pequabuck River; replicate and duplicate samples, a rinsate blank sample, and a trip blank sample were also collected to evaluate the surface water pathway in the vicinity of the FIP.

The following sediment samples were collected along the surface water pathway to evaluate observed releases and actual contamination targets which may be attributable to properties that are part of the FIP. Sample SD-01 was collected from the Shade Swamp Wildlife Area; SD-03/SD-04 were collected from the downstream discharge point from Scott Swamp Brook to the Pequabuck River; SD-07 was collected from the wetlands along Scott Swamp Brook downstream from its confluence with the FIP southern drainage swale; SD-08 was collected from the wetlands along Scott Swamp Brook downstream of its confluence with the western drainage swale; SD-09 was collected from the wetlands along Scott Swamp Brook, approximately 450 feet upstream of location SD-08; SD-10 was collected from wetlands along Scott Swamp Brook, downstream of its confluence with the West Branch of Scott Swamp Brook; SD-11 was collected from wetlands along the West Branch of Scott Swamp Brook; SD-11 was collected from wetlands along the West Branch of Scott Swamp Brook, at the point where overland runoff from the Connecticut Spring and Stamping property enters the brook.



LEGEND

- STATE WILDLIFE AREA PROPERTY LINE
- WETLAND
- SEDIMENT SAMPLE LOCATION
- SURFACE WATER SAMPLE LOCATION
- PPE TO SURFACE WATER
- MANMADE STREAM/SWALE
- STREAM/RIVER
- FISHERY
- CONNECTICUT SPRING & STAMPING CORPORATION

SURFACE WATER AND SEDIMENT SAMPLE LOCATION MAP
CONNECTICUT SPRING & STAMPING COMPANY
FARMINGTON INDUSTRIAL PARK PROPERTIES
FARMINGTON/PLAINVILLE, CONNECTICUT

WESTON MANAGERS DESIGNERS/CONSULTANTS

FIGURE 5

Surface water samples, SW-01 and SW-02, were collected within the Shade Swamp Wildlife Area to document the level of contamination within that sensitive environment. No other surface water samples were collected by WESTON. As previously stated, sediment sample SD-01 was also collected within Scott Swamp Brook, along with complete reference location samples documenting upstream concentrations. If sediment sample SD-01 reported observed release substances at the Shade Swamp Wildlife Area, the surface water samples would be used to determine if those substances exceeded applicable surface water quality benchmark values. Based on this rationale, no upstream reference surface water samples were collected.

The following table summarizes sediment samples collected along the West Branch of Scott Swamp Brook, Scott Swamp Brook, and the Pequabuck River to evaluate observed releases and targets within these water bodies, and the corresponding reference samples used to establish reference concentrations upstream of the FIP.

Sediment Sample No.	Spacial Location	Reference Sample Numbers
SD-01	Shade Swamp Wildlife Area; Pequabuck River	SD-02, SD-05, SD-06, SD-12, SD-13, SD-14, SD-15, SD-16, SD-17, SD-18, SD-19
SD-03/4	Wetlands; Pequabuck River	SD-05, SD-06, SD-12, SD-13, SD-14, SD-15, SD-16, SD-17, SD-18, SD-19
SD-07	Wetlands; Scott Swamp Brook	SD-12, SD-13, SD-14, SD-15, SD-16, SD-17, SD-18, SD-19
SD-08	Wetlands; Scott Swamp Brook	SD-12, SD-13, SD-14, SD-15, SD-16, SD-17
SD-09	Wetlands; Scott Swamp Brook	SD-12, SD-13, SD-14, SD-15
SD-10	Wetlands; Scott Swamp Brook	SD-12, SD-13, SD-14, SD-15
SD-11	Wetlands; West Branch of Scott Swamp Brook	SD-14, SD-15

Table 12 is a summary of organic compounds and inorganic elements detected through CLP analyses of WESTON sediment samples collected on July 12, 1995. A complete listing of analytical results is included in Attachment E. For each sample location, a compound or element is listed if it was detected at three times or greater than the appropriate reference sample concentration as described in the previous paragraphs. However, if the compound or element was not detected in the reference sample, the reference sample's SQL (for organic analyses) or SDL (for inorganic analyses) is used as the reference value. These compounds or elements are listed if they occurred at a value equal to or greater than the reference sample's SQL or SDL and are designated by their approximate relative concentration above these values.

Table 12

Summary of Analytical Results, Sediment Sample Analysis for Farmington Industrial Park Properties: Samples Collected by WESTON on July 12, 1995

Sample Location No.	Compound/Element	Concentration		Reference Concentration		Comments
SD-01 AHF02 MAGL19	**INORGANICS**					
	Chromium	159	mg/kg	42.6	mg/kg	3.7 × REF
SD-07 AHF08 MAGL25	**INORGANICS**					
	Selenium	0.84	mg/kg	0.81	U mg/kg	1.04 × SDL
SD-08 AHF09 MAGL26	**VOC**					
	2-Butanone	90	µg/kg	15	U µg/kg	6.0 × SQL
	Toluene	29	µg/kg	15	U µg/kg	1.93 × SQL
	PESTICIDE/PCB					
	4,4'-DDD	28	J µg/kg	4.9	UJ µg/kg	5.7 × SQL
	INORGANICS					
	Chromium	611	mg/kg	20.7	mg/kg	29.5 × REF
	Copper	93.4	J mg/kg	7.6	UJ mg/kg	12.3 × SDL
	Selenium	17.9	mg/kg	0.81	U mg/kg	22.1 × SDL
	Zinc	265	mg/kg	26.7	mg/kg	9.9 × REF
SD-09 AHF10 MAGL27	**SVOCS**					
	Di-n-butylphthalate	570	J µg/kg	490	U µg/kg	1.2 × SQL
	Bis(2-ethylhexyl)phthalate	860	J µg/kg	490	U µg/kg	1.8 × SQL
	PESTICIDE/PCB					
	4,4'-DDE	11	J µg/kg	4.9	UJ µg/kg	2.2 × SQL
	4,4'-DDD	43	J µg/kg	4.9	UJ µg/kg	8.8 × SQL
	INORGANICS					
	Arsenic	5.2	mg/kg	2.5	U mg/kg	2.1 × SDL
	Cadmium	1.6	mg/kg	0.32	U mg/kg	5.0 × SDL
	Chromium	195	mg/kg	20.7	mg/kg	9.4 × REF
	Copper	50.6	J mg/kg	7.6	UJ mg/kg	6.7 × SDL
	Lead	74.1	mg/kg	21.6	mg/kg	3.4 × REF

Table 12

Summary of Analytical Results, Sediment Sample Analysis for Farmington Industrial Park Properties: Samples Collected by WESTON on July 12, 1995 (concluded)

Sample Location No.	Compound/Element	Concentration		Reference Concentration		Comments
SD-09 (concluded)	Mercury	0.17	mg/kg	0.08	U mg/kg	2.1 × SDL
	Selenium	7.7	mg/kg	0.81	U mg/kg	9.5 × SDL
	Zinc	209	mg/kg	26.7	mg/kg	7.8 × REF
SD-11 AHF12 MAGL29	**VOCS**					
	TCE	17	µg/kg	12	µg/kg	1.4 × SQL
	PCE	65	µg/kg	12	µg/kg	5.4 × SQL

UJ = The compound was analyzed for; but was not detected. The SQL is an estimated quantity.

Four VOCs, 2-butanone, toluene, TCE and PCE, were detected between 1.4 and 6.0 times the SQL in sediment samples collected from wetlands along Scott Swamp Brook and the West Branch of Scott Swamp Brook. The detection of TCE and PCE in sediment sample SD-11 is consistent with past use of chlorinated solvents at the properties in the FIP and with substances detected in groundwater samples collected from public drinking water wells in the area. No other VOCs were detected in sediment samples collected by WESTON.

Two SVOCs, di-n-butylphthalate and bis(2-ethylhexyl)phthalate were detected in sediment sample SD-09 at 1.2 and 1.8 times the SQL, respectively [41]. SD-09 was collected from the wetlands along Scott Swamp Brook, approximately 450 feet upstream of location SD-08. The concentrations associated with the SVOCs detected in sample SD-09 were estimated. WESTON has included the detected concentrations of these SVOCs to remain consistent with technical directives provided by EPA Region I. Two pesticides were also detected in WESTON sediment samples; however, based on operational records provided by the properties that WESTON is conducting SIP investigations and prior analytical results of samples collected from FIP properties under WESTON SIP investigations; these pesticides will not be considered attributable to the Connecticut Spring property for the purposes of this SIP. Further, pesticides are ubiquitous in the environment and are used for routine pest and foliage control [41; 53, pp. 14-15].

Eight inorganic elements were detected in WESTON sediment samples ranging between 1.04 times the SDL (selenium) and 29.5 times the reference concentration (chromium). Values associated with the inorganic element copper at sample locations SD-08 and SD-09 were estimated [50]. WESTON has included the detected concentrations of this inorganic element to remain consistent with technical directives provided by EPA Region I. No other substances were detected in WESTON sediment samples.

Surface water samples were collected within the Shade Swamp Wildlife Area to document the level of contamination within that sensitive environment. No other surface water samples were collected by WESTON. Sediment samples were also collected with complete reference location samples, documenting upstream concentrations. If sediment sample SD-01 reported observed release substances at the Shade Swamp Wildlife Area, surface water samples would be used to determine if those substances exceeded applicable surface water quality benchmark values. Based on this rationale, no upstream reference surface water samples were collected. Surface water sample results were compared with the Ambient Water Quality Criteria (AWQC) and the Ambient Aquatic Life Advisory Concentration (AALAC) benchmarks [20; 41; 50; 58]. Table 13 is a summary of organic compounds and inorganic elements detected through CLP analyses of WESTON surface water samples [20; 41; 50; 58].

Table 13

Summary of Analytical Results, Surface Water Sample Analysis for Farmington Industrial Park Properties: Samples Collected by WESTON on July 12, 1995

Sample Location No.	Compound/Element	Concentration (μg/L)	Benchmark Concentration (μg/L)	Comments
SW-01 AHF30 MAGL47	**INORGANICS**			
	Aluminum	472 J	--	NA
	Barium	39.1 J	--	NA
	Calcium	10,700 J	--	NA
	Iron	1,180 J	1,000	1.18 x BM
	Lead	10.1 J	3.2	3.16 x BM
	Magnesium	1,970 J	--	NA
	Manganese	134 J	--	NA
	Nickel	6.4 J	160	Below BM
	Potassium	3,330 J	--	NA
	Sodium	16,000 J	--	
SW-02 AHF31 MAGL48	**INORGANICS**			
	Aluminum	442 J	--	NA
	Barium	39.1 J	--	NA
	Calcium	10,800 J	--	NA
	Iron	1,120 J	1,000	1.12 x BM
	Lead	10.1 J	3.2	3.16 x BM
	Magnesium	2,000 J	--	NA

Table 13

Summary of Analytical Results, Surface Water Sample Analysis for Farmington Industrial Park Properties: Samples Collected by WESTON on July 12, 1995 (concluded)

Sample Location No.	Compound/Element	Concentration ($\mu g/L$)	Benchmark Concentration ($\mu g/L$)	Comments
SW-02 (concluded)	Manganese	133 J	--	NA
	Nickel	8.3 J	160	Below BM
	Potassium	3,260 J	--	NA
	Sodium	16,000 J	--	NA

-- = No AWQC/AALAC Benchmark is provided for this contaminant.
BM = AWQC and AALAC Benchmark used as the ecological-based standard.

There were no elevated levels of VOCs, SVOCs, pesticides, or PCBs detected in surface water samples collected by WESTON on July 12, 1995. However, both SW-01 and SW-02 revealed elevated concentrations of ten inorganic elements. Of the ten inorganic elements detected, only two, iron and lead, exceeded environmental benchmarks. None of the inorganic elements detected in surface water samples SW-01 and SW-02 were detected in sediment sample SD-01 [41; 50; 58]. The complete analytical results of the WESTON sampling are included in Attachment E.

SOIL EXPOSURE PATHWAY

There are no on-site residents at the Connecticut Spring property; however, approximately 400 full-time workers are currently employed at the property [3]. Properties to the north and west of the Connecticut Spring property are not susceptible to surficial migration from potential on-site contamination due to the up-hill sloping topography [3; 4; 53]. According to the Town of Farmington Tax Assessor's Map No. 77, the nearest residence to the Connecticut Spring property is depicted as Lot No. 56, located approximately 600 feet west at 37 Wells Drive (Figure 1A) [4]. An estimated 2,890 people live within one radial mile of the Connecticut Spring property, including on-site workers [11]. No known terrestrial sensitive environments are located on the Connecticut Spring property [3; 54; 55]. There are no schools or day care centers within 200 feet of identified source areas on the Connecticut Spring property [3; 4; 53].

In December 1981, a Hubbard Hall tank truck spilled approximately 400 to 800 gallons of PCE while refilling an on-site AST along an unpaved area on the service road east of the manufacturing building [1]. This incident was reported to the CT DEP and Hubbard Hall subsequently removed 18 inches of soil in a 35-foot radius (or 30 tons) around the spill area [1].

In 1987, CT DEP collected 13 soil samples to evaluate the Connecticut Spring property [1]. The exact depths at which the samples were collected could not be determined from available file information. Several VOCs were detected in soil samples. Analytical results from the CT DEP sampling events are discussed in detail in the Waste/Source Sampling Section of this report.

In July 1987, TRC collected six soil samples, including reference and duplicate samples at the property [62]. TRC soil samples were reportedly collected between 0 and 2 feet bgs [62]. Samples were analyzed for VOCs only using EPA Methods 8010, 8015, and 8020 for soils and EPA Method 601 for surface water [62]. Analytical results of TRC samples reported several chlorinated compounds in soil; the results are further discussed in the Waste/Source Sampling Section of this report.

In 1989, HRP completed a total of 16 borings at the property [61]. Soil samples were collected continuously in all the borings except BR-2, BR-3, and BR-4, which were sampled at 5-foot intervals. Samples were collected between 0 and 44 feet bgs. Soil samples were collected and analyzed for VOCs using EPA Method 8010 [61]. Elevated concentrations of VOCs were detected between 0 and 2 feet bgs which support surficial soil contamination at the property. HRP sampling events conducted to evaluate the Connecticut Spring property are discussed in detail in the Waste/Source Sampling Section of this report.

Based on documented historic on-site spills and analytical results from on-site soil samples, an area of soil contamination measuring approximately 50,000 sq ft is assumed for the purpose of this SIP. The detection of PCE in on-site soil samples is consistent with the 1981 on-site spill and the use and storage of this substance at the property [1].

Based on available file information, no other known on-site source sampling has occurred at the Connecticut Spring property.

AIR PATHWAY

The nearest individuals to the Connecticut Spring property are 400 full-time workers employed by Connecticut Spring [3, p. 1]. According to the Town of Farmington Tax Assessor's Map No. 77, the nearest residence is located approximately 600 feet west of the property at 37 Wells Drive (Figure 1A) [4; 53]. The nearest school is the Wheeler Elementary School which has an enrollment of an estimated 376 students. The Wheeler Elementary School is located approximately 1.2 miles south of the Connecticut Spring property. An estimated 89,325 people live within a four-mile radius of the Connecticut Spring property, including on-site workers [11]. No known sensitive environments are located on the property. Table 14 summarizes the residential population located within four radial miles of the Connecticut Spring property [3; 11].

Table 14

Estimated Population within Four Miles of Connecticut Spring & Stamping Company

Radial Distance from Connecticut Spring (miles)	Estimated Population
On-site workers	400
0.00 < 0.25	164
0.25 < 0.50	442
0.50 < 1.00	1,884
1.00 < 2.00	15,015
2.00 < 3.00	30,500
3.00 < 4.00	40,920
TOTAL	**89,325**

The approximate total wetland area within four radial miles of the property is 2,000 acres [52]. In addition, several sensitive environments are located within four radial miles of the Connecticut Spring property, including one State-listed endangered species and two State listed threatened species. Table 15 summarizes these and other sensitive environments located within four miles of the Connecticut Spring property [20; 42; 52; 54; 55]. Sensitive environments listed on Table 15 which are available to the surface water pathway have also been discussed in that section of this report.

Table 15

Sensitive Environments within Four Miles of Connecticut Spring & Stamping Company

Radial Distance from Connecticut Spring (miles)	Sensitive Environment/Species (status)
0.00 < 0.25	West Branch of Scott Swamp Brook (Clean Water Act)
	0 acres of wetlands
0.25 < 0.50	0.5 acres of wetlands
0.50 < 1.00	20 acres of wetlands
	Hydrastis canadensis (State Endangered)
	Dicentra canadensis (State Threatened)

Table 15

Sensitive Environments within Four Miles of Connecticut Spring & Stamping Company (concluded)

Radial Distance from Connecticut Spring (miles)	Sensitive Environment/Species (status)
1.00 < 2.00	1,290 acres of wetlands
	Vitis novae-angliae (State Special Concern)
	Lygodium palmatum (State Special Concern)
	Alluvial Swamp (Unique Biotic Community)
2.00 < 3.00	320 acres of wetlands
	Apectrum hyemale (State Special Concern)
	Hydrophyllum virginianum (State Special Concern)
	Dicentra canadensis (State Threatened)
	Dryopteris goldiana (State Threatened)
3.00 < 4.00	370 acres of wetlands
	Hydrastis canadensis (State Endangered)
	Dicentra canadensis (State Threatened)
	Platanthera Dilatata (State Special Concern)

No known prior air sampling has been performed at the Connecticut Spring property. However, on March 8, 1995, during the WESTON on-site reconnaissance, ambient air monitoring was conducted utilizing a photoionization detector; no readings above background were recorded [3, p. 4].

SUMMARY

The Connecticut Spring & Stamping Company (Connecticut Spring) property is part of the Farmington Industrial Park (FIP) and is located at 48 Spring Lane in Farmington, Hartford County, Connecticut at geographic coordinates 41° 42′ 06″ north latitude and 72° 52′ 12″ west longitude. According to the Farmington Tax Assessor's Office, the Connecticut Spring property is depicted on Map No. 77 as Lot No. 12C and is owned by the Connecticut Spring and Stamping Corporation. Connecticut Spring was established at this location in 1960.

The Connecticut Spring property is approximately 17.5 acres and is occupied by a single 120,000-square foot (sq ft) manufacturing building. The surrounding area is zoned for industrial and residential use. The Connecticut Spring property is abutted to the north by New England

Aircraft Plant #1 (CERCLIS No. CTD059831479), to the west by Spring Lane and Edmunds Manufacturing (CERCLIS No. CTD054187455), to the south by the New England Clock Company, and to the east by a steep slope leading down to the West Branch of Scott Swamp Brook.

Prior to development in 1960, the Connecticut Spring property and surrounding properties were reportedly used for agricultural purposes. Manufacturing processes at the Connecticut Spring property include; stamping, winding, degreasing, tumbling, and tempering. Wastes generated at the property reportedly include metal chips, unspecified cleaning solvents, and cutting oils.

During 1970, more than 2,000 gallons per day (gpd) of metal preparation wastes, including solvents and tumbling wastes were discharged to a 2,000-gallon septic tank and leaching area located under the west side of the manufacturing building. In addition, Connecticut Spring reportedly discharged air compressor cooling water to Scott Swamp Brook. Sanitary wastes were directed to two additional septic systems; one southeast of the manufacturing building and the other east of the manufacturing building. The exact location of these three septic tanks is not known. In addition, waste disposal practices prior to 1970 could not be determined from available file information.

A 1970 State of Connecticut Water Resources Commission (CT WRC) inspection (Form P-5) reported that Connecticut Spring generated the following wastes; metal scraps, water and oils, oil, tetrachloroethylene (PCE), and trichloroethylene (TCE), grinding dust, and cyanide solution. According to the inspection, wastes generated during on-site manufacturing operations were discharged to the ground this practice took place from approximately 1970 to 1973.

During 1973, Connecticut Spring reportedly discharged 200 gpd of acidic passivating wastes (sulfuric acid, nitric acid, hydrochloric acids; potassium permanganate, dichromate, sodium cyanide, hexavalent chromium, cyanide, carbonate, and hydroxide) to the sanitary septic system located southeast of the manufacturing building. In addition, 260 gpd of finishing wastes (chemical cleaners and rust preventing oils) were reportedly discharged to the septic tank and leachfield under the west side of the manufacturing building, during 1973.

In March 1980, a Connecticut Department of Environmental Protection (CT DEP) Water Compliance Unit (WCU) inspection reported that an unspecified solvent storage tank with a leaking line and a small drum storage area were located in the vicinity of the northwest parking lot corner. It was not specified at which parking lot the drum storage area was located. The WCU inspection also identified a 385-foot production well that Connecticut Spring installed in 1979 near the southeast corner of the manufacturing building. Water from the on-site production well was used for air conditioning and air compressor cooling prior to 1988, at which time it was determined that the water reportedly contained elevated concentrations of solvents. Water is currently supplied by public sources.

In June 1980, the CT DEP WCU issued order number 2824 to Connecticut Spring to install treatment equipment and conduct a groundwater study due to elevated concentrations of volatile organic compounds (VOCs) detected in the nearby FIP and Johnson Avenue wells.

In December 1981, a Hubbard Hall tank truck spilled approximately 400 to 800 gallons of PCE along an unpaved area on the service road east of the manufacturing building while refilling an on-site solvent tank. An unknown quantity of PCE may have entered Scott Swamp Brook before it could be contained. This incident was reported to the CT DEP and Hubbard Hall subsequently removed approximately 18 inches of soil in a 35-foot radius (or 30 tons) around the spill area.

On May 12, 1982, CT DEP referred order number 2824 to the Office of the Attorney General as Connecticut Spring had not completed the requested groundwater investigation. On May 20, 1982, Connecticut Spring informed CT DEP that TRC Environmental Consultants, Inc. (TRC) had been retained to perform the groundwater investigation. In late 1982, CT DEP requested Connecticut Spring to attend a meeting with other companies within the FIP and to consider a joint groundwater investigation. After Connecticut Spring agreed to the FIP groundwater study, the CT DEP withdrew the referral to the Attorney General's Office. A March 1986 Preliminary Assessment (PA) conducted by CT DEP reported that the joint groundwater investigation was not completed.

Between December 1986 and March 1987, CT DEP collected 13 soil and 21 surface water samples at the Connecticut Spring property. CT DEP samples were analyzed for VOCs; however, the exact analytical method used could not be determined from available file information. In addition, no known reference or quality assurance/quality control (QA/QC) samples were collected. Analytical results from the CT DEP sampling events reported several VOCs above detection limits.

In July 1987, TRC collected six soil and four surface water samples, including reference and duplicate samples at the Connecticut Spring property. The samples were analyzed for VOCs using EPA Methods 8010, 8015, and 8020 for soils and EPA Method 601 for surface water. Analytical results indicated the presence of several chlorinated compounds in soil and surface water samples.

In May and June 1988, TRC advanced seven soil borings, installed seven monitoring wells, and collected subsurface soil and groundwater samples to further evaluate the Connecticut Spring property. The samples were analyzed for VOCs using EPA Method 8010. In addition, CT DEP collected groundwater samples from TRC monitoring wells during this same period. Results from the two sampling events reported elevated concentrations of eight VOCs in TRC groundwater samples, two VOCs in TRC soil samples, and ten VOCs in the CT DEP samples.

In 1989, Hubbard Hall contracted HRP Associates Inc. (HRP) to investigate the potential impact to on-site groundwater caused by the 1981 PCE spill. In October 1989, HRP completed a total of 16 borings and installed monitoring wells at each location. Soil samples were collected continuously in the borings except BR-2, BR-3, and BR-4, which were sampled at 5-foot intervals. Soil samples were analyzed for VOCs using EPA Method 8010. HRP sampling detected elevated concentrations of several VOCs consistent with previous sampling results.

In June and August 1990, HRP collected twelve surface water samples from the West Branch of Scott Swamp Brook. The samples were analyzed for VOCs using EPA Method 601/8010. The results indicated that every sample except SW-1 and SW-2, exhibited elevated concentrations of the VOCs PCE, TCE, and 1,1,1-TCA.

In July 1990, NUS Corporation Field Investigation Team (NUS/FIT) completed a Screening Site Inspection (SSI) of the Connecticut Spring property. No environmental sampling was conducted as part of the SSI.

On March 8, 1995, Roy F. Weston, Inc. (WESTON) and CDM Federal Programs Corporation conducted a joint on-site reconnaissance at the Connecticut Spring property. On July 12, 1995, WESTON collected 11 groundwater, 21 sediment and 2 surface water samples at locations up-gradient and down-gradient of the Connecticut Spring property. WESTON samples were submitted through the U.S. Environmental Protection Agency (EPA) Contract Laboratory Program (CLP) for VOC, semivolatile organic compound (SVOC), pesticide/polychlorinated biphenyl (PCB), total metals and cyanide analyses. The VOC fraction of the groundwater samples was analyzed to lower detection limits by EPA Method 524.2 through the EPA Region I Regional Laboratory.

According to State file information, The Connecticut Department of Health Services (CT DHS) initially collected and analyzed samples from the four FIP wells and Johnson Avenue Well No. 3 in June 1975. Available records indicate that Johnson Avenue Well No. 6 was first sampled in June 1982.

Analytical results from the June 1975 sampling round of the four FIP wells and Johnson Avenue Well No. 3 indicated the presence of several VOCs at concentrations ranging from 20 to 1,000 parts per billion (ppb). The compounds present at the highest concentrations from the June 1975 sampling round included 1,1,1-trichloroethane (1,1,1-TCA) at 1,000 ppb, chloroform at 680 ppb, PCE at 640 ppb, and TCE at 430 ppb. The highest concentrations of 1,1,1-TCA, TCE, and chloroform were noted in samples collected from Johnson Avenue Well No. 3, and the highest concentration of PCE was detected in the sample collected from FIP Well No. 4.

- <u>Chloroform</u> - Based on the analytical results, it appears that the presence of chloroform in the FIP and Johnson Avenue Wells may have been an isolated incident. Chloroform does not appear to be a continuing source of contamination in the FIP and Johnson Avenue wells. Based on the detection of elevated concentrations of chloroform in CT DEP groundwater sampling results used to evaluate the Connecticut Spring property, chloroform may be considered attributable to the Connecticut Spring property for the purposes of this Site Inspection Prioritization (SIP).

- <u>1,1,1-Trichloroethane</u> - Based on prior analytical data from on-site samples collected by CT DEP, TRC, and HRP, 1,1,1-TCA may be considered attributable to the Connecticut Spring property for the purposes of this SIP. 1,1,1-TCA may degrade in soils and groundwater to 1,1-dichloroethylene (1,1-DCE), 1,1-dichloroethane (1,1-DCA), cis-1,2-dichloroethylene (cis-1,2-DCE), chloroethane, vinyl chloride, and acetic acid. The degradation of 1,1,1-TCA to 1,1-DCE, 1,1-DCA, cis-1,2-DCE, and chloroethane may explain the presence of these substances in samples collected to evaluate the property.

- <u>Trichloroethylene</u> - For the purpose of this SIP, the detected concentrations of TCE may be considered attributable to the Connecticut Spring property since this substance has been used and generated as a waste during production operations at the manufacturing building. In addition, elevated concentrations of TCE have been detected in samples collected to evaluate the property by CT DEP, TRC, and HRP. TCE may degrade in soils and groundwater to cis-1,2-DCE and vinyl chloride. The degradation of TCE to cis-1,2-DCE may explain the presence of this substance in samples collected to evaluate the property.

- Tetrachloroethylene - For the purpose of this SIP, PCE may be considered attributable to the Connecticut Spring property since this substance has been used and generated during on-site operations. Further, NUS/FIT documented the 1981 spill of approximately 400 to 800 gallons of waste PCE to the ground along the eastern portion of the manufacturing building. In addition, elevated concentrations of PCE have been detected in samples collected by CT DEP, TRC, and HRP to evaluate the property. PCE may degrade in soils and groundwater to TCE, cis-1,2-DCE, and vinyl chloride. The degradation of PCE to TCE and cis-1,2-DCE may explain the presence of these substances in samples collected to evaluate the property.

No known drinking water intakes are located within 15 downstream miles of the Connecticut Spring property. Scott Swamp Brook (downstream of Hyde Road in Farmington, Connecticut) and the Pequabuck River are considered the nearest fisheries, although neither water body is stocked. The Farmington River is one of Connecticut's premier trout fisheries. It is stocked by the State of Connecticut with trout and Atlantic Salmon at locations upstream and downstream of Farmington. The segment of the Farmington River downstream of the Connecticut Spring property is classified as a warm-water fishery by CT DEP, which is currently attempting to restore the Atlantic Salmon to the river. None of the fisheries downstream of the Connecticut Spring property have been closed.

The nearest individuals to the Connecticut Spring property are 400 full-time workers employed by Connecticut Spring. According to the Town of Farmington Tax Assessor's Map No. 77, the nearest residence is located approximately 600 feet west of the property at 37 Wells Drive. The nearest school is the Wheeler Elementary School which has an enrollment of an estimated 376 students. The Wheeler Elementary School is located approximately 1.2 miles south of the Connecticut Spring property. An estimated 89,325 people live within a four-mile radius of the Connecticut Spring property, including on-site workers. No known sensitive environments are located on the property.

REFERENCES
CONNECTICUT SPRING & STAMPING COMPANY

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ATTACHMENT A

CONNECTICUT SPRING & STAMPING COMPANY

SOIL, SURFACE WATER, AND GROUNDWATER
SAMPLE ANALYTICAL RESULTS
CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION

Samples collected from 1986 to 1988

ATTACHMENT B

CONNECTICUT SPRING & STAMPING COMPANY

SOIL, SURFACE WATER, AND GROUNDWATER SAMPLE ANALYTICAL RESULTS TRC ENVIRONMENTAL CONSULTANTS, INC.

Samples collected from 1987 to 1988

ATTACHMENT C

CONNECTICUT SPRING & STAMPING COMPANY

SOIL, SURFACE WATER, AND GROUNDWATER SAMPLE ANALYTICAL RESULTS HRP ASSOCIATES INC.

Samples collected from 1989 to 1990

ATTACHMENT D

CONNECTICUT SPRING & STAMPING COMPANY

FIP AND JOHNSON AVENUE WELLS DRINKING WATER SAMPLE ANALYTICAL RESULTS CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION

Samples collected from 1975 to 1989

ATTACHMENT E

CONNECTICUT SPRING & STAMPING COMPANY

FIP AND JOHNSON AVENUE WELLS DRINKING WATER SAMPLE ANALYTICAL RESULTS UNIONVILLE AND PLAINVILLE WATER COMPANIES

Samples collected January 21, 1994 and January 26, 1995

ATTACHMENT F

CONNECTICUT SPRING & STAMPING COMPANY

GROUNDWATER, SEDIMENT, AND SURFACE WATER
SAMPLE ANALYTICAL RESULTS
ROY F. WESTON, INC.

Samples collected July 12, 1995